

A surreal, painterly illustration of a city. In the foreground, a large, dark green dinosaur stands on the left. To its right, two men in trench coats and hats are looking at a small, ornate blue teapot. The background features a city with colorful, rounded buildings, a tall white rocket with a red nose cone, and a large, stylized plant with a crown-like top. The sky is dark and cloudy. The overall style is reminiscent of mid-20th-century science fiction art.

if

WORLDS of SCIENCE FICTION

SEPTEMBER 1953 • 35 CENTS

The most fascinating science fiction theme of 1953!

A CASE OF CONSCIENCE

A new short novel by JAMES BLISH

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THE RINGS OF SATURN would be one of the most spectacular sights encountered by space explorers. Comprised of millions of tiny moonlets in three bands, the rings are brighter than the planet itself. Although the distance from the inner to the outer edge is 41,500 miles, they are microscopically thin by comparison—ten miles at most—and fade away toward the inner edge.

ILLUSTRATION BY J. J. ...



WORLDS of SCIENCE FICTION

SEPTEMBER 1953

All Stories New and Complete

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A CHAT WITH THE EDITOR

THERE WAS a cartoon I liked in the "1983 Almanack" issue of *Punch*, the British humorous weekly. This special issue contained an interplanetary section, partly hilarious and partly incomprehensible. The cartoon, signed by "Sprod," pictures a moonscape. Three Earthmen in bubble helmets stand gazing at the smouldering, burned-out shell of their spaceship, which has obviously exploded and crashed. They are smiling. One of them is saying brightly, "Ah well, thank goodness we still have our sense of humor."

One of the basic assumptions, I suppose, is that a spaceship flying the Union Jack will be the first to reach the moon. The cartoonist is clearly poking some fond fun at his countrymen as well as at science fiction. And while his prediction may be parades off the orbit, his attitude has my warm approval.

I won't say it's more humor that science fiction needs. Good science fiction humor is hard to write, largely because good humor is hard to write, period. There are people who do marvelously well at it: William Tenn, Damon Knight, Frederic Brown, Mack Reynolds, Henry Kuttner, C. M. Kornbluth, R. Bretton, L. Sprague de Camp, Wilson Tucker, for instance. Fritz Leiber's fabulously funny "The Night He Cried" in Frederik Pohl's latest anthology, *Star Science Fiction Stories*, comes as somewhat of a surprise, but is evidence that any good writer can do it even though it's not his usual forte.

What have these people got besides basic writing talent, science fictional imaginations, and the willingness to work hard for love of the medium first and remuneration second? Not just a sense of humor, surely. It's more all-encompassing than that.

I THINK it is simply a certain amount of healthy perspective, an ability to step back from a problem and view it from various angles. This is a highly desirable quality for any writer and any person, but that doesn't mean everyone who writes science fiction has it! There has always been bad science fiction. We're extremely fortunate that the percentage is not noticeably higher than before, now that the field has expanded so enormously.

The world today is in many ways a gloomy and frightening place. It will quite likely get worse before it gets better. It's even possible that man will blow himself and his works completely to smithereens...

Wait a minute, though—completely to smitherens? Shucks, almost nothing succeeds that well. Somebody and something would be left after the smash. And it wouldn't have to be a primitive tribe of rain-worshippers in the Brazilian jungles, one lone man who just happened to be down in a mine shaft (while all the miners elsewhere in the world were out on strike, presumably), or (this one is more rare now, anyway) Prof. Superpill and his carefully selected group of vegetarians in their invisible dome of force at the South Pole. It could be a small town in the Ozarks; you find some surprisingly intellectual and creative crannies of culture there, believe it or not! It could be a comic opera-type Balkan kingdom, population 317 including the village werewolf and a beautiful princess, which has been so neutral for centuries that it has even prohibited radios for fear the children might learn the word "war." It could . . . But you get the idea; take it from there and write a story!

Another theme dear to would-be science fiction writers these days is the idea of Earth's civilization being unacceptable to the representatives of the Galactic Federation. These superbeings, you know, put up "No Trespassing" signs just beyond our atmosphere, reverse the laws of physics so that rockets *do* need something to push against, or just plain smack us out of existence with a cosmic flyswatter.

It can be done well, and sometimes is. But since most of us are incapable of figuring out how completely rational beings would act, and even less capable of making

such beings convincing on paper, there's little excuse for writing it again without a new twist. Why not give the Galactic Federation some eccentricities?

LET'S NOT have Pollyanna-ism. If an unhappy ending is called for, it should be used. (I keep insisting that the essence of true tragedy is its inevitability. I get into more darned arguments that way—but can you prove me wrong with examples from literature?) I won't reject a good story if it's unhappy. It can even be unpleasant; shock value can be highly effective if controlled properly. I won't buy a bad story just for a few yuks. But I'll always suspect that the writer who is willing to at least attempt humor is a healthier specimen than the constant doom-crier.

The lowliest newspaper columnist can indulge in all the dirt forebodings we need. If science fiction is going to be distinguishable from a newspaper column, it has no choice but to consider the infinite possibilities of our not blowing ourselves up tomorrow. If the world of today looks bleak to you, extend its trends until they become ridiculous. Remember that there will always be counter-trends. Or forget them all, and create a whole new world. If it's consistent within its own terms, it can be the basis for a good story.

Nobody will write that story while worrying himself sick over when the bombs are going to fall. He'll write it when he starts considering ways to keep the bombs from falling. And that includes, of course, the repeal of the law of gravity.

—Itz



Rarely, if ever, has science fiction plumbed so deeply and with such sensitivity the depths of human thoughts and emotions as in this case. For here, Earth-men's vote has a direct effect upon the future of a planet, their own culture and the universe itself.

A CASE OF CONSCIENCE

By James Blish

Illustrated by Ed Smith

THE STONE door slammed. It was Cleaver's trade-mark: there had never been a door too heavy, complex, or cleverly tracked to prevent him from closing it with a sound like a clap of doom. And no planet in the universe could possess an air sufficiently thick and curtained with damp to muffle that sound. Not even Lithia.

Ruiz-Sanchez continued to read. It would take Cleaver's impatient fingers quite a while to free him from his jungle suit, and in the meantime the problem remained. It was a century-old problem, first propounded in 1939, but the Church had never cracked it. And it was diabolically complex (that adverb was official, precisely chosen and literally intended). Even the

novel which proposed the case was on the Index, and Father Ramon Ruiz-Sanchez, S. J., had access to it only by virtue of his Order.

He turned the page, scarcely hearing the stamping and muttering in the hall. On and on the text ran, becoming more tangled, more evil, more insoluble with every word:

"... and Magravius knows from spies that Anita has formerly committed double sacrilege with Michael, vulgo Cerularius, a perpetual curate, who wishes to seduce Eugenius. Magravius threatens to have Anita molested by Sulla, an orthodox savage (and leader of a band of twelve-mercenaries, the Sullivani), who desires to procure Felicia for Gregorius, Leo, Vitellius

and Macdugalius, four excavators, if she will not yield to him and also deceive Honuphrius by rendering conjugal duty when demanded. Anita, who claims to have discovered incestuous temptations from Jeremiah and Eugenius—"

There now, he was lost again. He backtracked resignedly. Jeremiah and Eugenius were—? Oh, yes, the "brotherly lovers" at the beginning of the case, consanguineous to the lowest degree with both Felicia and Honuphrius—the latter the apparent prime villain and the husband of Anita. It was Magravius, who seemed to admire Honuphrius, who had been urged by the slave Maritius to solicit Anita, seemingly under the urging of Honuphrius himself. This, however, had come to Anita through her firewoman Fortissa, who was or at one time had been the common-law wife of Mauritius himself and had borne him children—so that the whole story had to be weighed with the utmost caution. And that entire initial confession of Honuphrius had come out under torture—voluntarily consented to, to be sure, but still torture. The Fortissa-Mauritius relationship was even more dubious, really only a supposition of Father Ware's, though certainly a plausible one considering the public repentance of Sulla after the death of Canicula, who was—yes, that was correct, Mauritius' second wife. No, his first wife; he had never been legally married to Fortissa. It was Magravius' desire for Felicia after the death of Gillia that had confused him there.

"Ramon, give me a hand, will you?" Cleaver shouted suddenly.

"I'm stuck and—and I don't feel well."

The Jesuit biologist arose in alarm. Such an admission from Cleaver was unprecedented.

THE PHYSICIST was sitting on a pouf of woven rushes, stuffed with a sphagnum-like moss, which was bulging at the equator under his weight. He was half-way out of his glass-fiber jungle suit, and his face was white and beaded with sweat, although his helmet was already off. His uncertain fingers tore at a jammed zipper.

"Paul! Why didn't you say you were ill in the first place? Here, let go of that; you're only making things worse. What happened?"

"Don't know exactly," Cleaver said, breathing heavily but relinquishing the zipper. Ruiz-Sanchez knelt beside him and began to work it carefully back onto its tracks. "Went a ways into the jungle to see if I could spot more pegmatite lies; it's been in the back of my mind that a pilot-plant for turning out tritium might locate here eventually—ought to be able to produce on a prodigious scale."

"God forbid," Ruiz-Sanchez said under his breath.

"Hm? Anyhow, I didn't see anything. Few lizards, hoppers, the usual thing. Then I ran up against a plant that looked a little like a pineapple, and one of the spines jabbed right through my suit and nicked me. Didn't seem serious, but—"

"But we don't have the suits for nothing. Let's look at it. Here, put up your feet and we'll haul those boots off. Where did you get

—oh. Well, it's angry-looking, I'll give it that. Any other symptoms?"

"My mouth feels raw," Cleaver complained.

"Open up," the Jesuit commanded. When Cleaver complied, it became evident that his complaint had been the understatement of the year. The mucosa inside his mouth was nearly covered with ugly and undoubtedly painful ulcers, their edges as sharply defined as if cut with a cookie-punch.

Ruiz-Sanchez made no comment, however, and deliberately changed his expression to one of carefully calculated dismissal. If the physicist needed to minimize his ailments, it was all right with Ruiz-Sanchez. An alien planet is not a good place to strip a man of his inner defenses. "Come into the lab," he said. "You've got some inflammation in there."

Cleaver arose, a little unsteadily, and followed the Jesuit into the laboratory. There Ruiz-Sanchez took smears from several of the ulcers onto microscope slides and Gram-stained them. He filled the time consumed by the staining process with the ritual of aiming the microscope's substage mirror out the window at a brilliant white cloud. When the timer's alarm went off, he rinsed and flame-dried the first slide and slipped it under the clips.

As he had half feared, he saw few of the mixed bacilli and spirochetes which would have indicated a case of ordinary, Earthly, Vincent's angina—which the clinical picture certainly suggested. Cleaver's oral flora were normal, though on the increase because of all the

exposed tissue.

"I'm going to give you a shot," Ruiz-Sanchez said gently. "And then I think you'd better go to bed."

"The hell with that," Cleaver said. "I've got nine times as much work to do as I can hope to clean up, without any additional handicaps."

"Illness is never convenient," Ruiz-Sanchez agreed. "But why worry about losing a day or so, since you're in over your head anyhow?"

"What have I got?" Cleaver asked suspiciously.

"You haven't got anything," Ruiz-Sanchez said, almost regretfully. "That is, you aren't infected. But your 'pineapple' did you a bad turn. Most plants of that family on Lithia bear thorns or leaves coated with polysaccharides that are poisonous to us. The particular glucoside you got today was evidently squill, or something closely related to it. It produces symptoms like those of trench-mouth, but a lot harder to clear up."

"How long will that take?" Cleaver said. He was still balking, but he was on the defensive now.

"Several days at least—until you've built up an immunity. The shot I'm going to give you is a gamma globulin specific against squill, and it ought to moderate the symptoms until you've developed a high antibody titer of your own. But in the process you're going to run quite a fever, Paul; and I'll have to keep you well stuffed with antipyretics, because even a little fever is dangerous in this climate."

"I know it," Cleaver said, mollified. "The more I learn about this

place, the less disposed I am to vote 'aye' when the time comes. Well, bring on your shot—and your aspirin. I suppose I ought to be glad it isn't a bacterial infection, or the Snakes would be jabbing me full of antibiotics."

"Small chance of that," Ruiz-Sanchez said. "I don't doubt that the Lithians have at least a hundred different antibiotics we'll be able to use eventually, but—there, that's all there is to it; you can relax now—but we'll have to study their pharmacology from the ground up, first. All right, Paul, hit the hammock. In about ten minutes you're going to wish you were born dead, that I promise you."

CLEAVER grinned. His sweaty face under its thatch of dirty blond hair was craggy and powerful even in illness. He stood up and deliberately rolled down his sleeve. "Not much doubt about how you'll vote, either," he said. "You like this planet, don't you, Ramon? It's a biologist's paradise, as far as I can see."

"I do like it," the priest said, smiling back. He followed Cleaver into the small room which served them both as sleeping quarters. Except for the window, it strongly resembled the inside of a jug. The walls were curving and continuous, and were made of some ceramic material which never beaded or felt wet, but never seemed to be quite dry, either. The hammocks were slung from hooks which projected smoothly from the walls. "But don't forget that Lithia's my first extra-

solar planet. I think I'd find any new, habitable world fascinating. The infinite mutability of life-forms, and the cunning inherent in each of them . . . It's all amazing and very delightful."

Cleaver sprawled heavily in his hammock. After a decent interval, Ruiz-Sanchez took the liberty of heaving up after him the foot he seemed to have forgotten. Cleaver didn't notice. The reaction was setting in.

"Read me no tracts, Father," Cleaver said. Then: "I didn't mean that. I'm sorry . . . But for a physicist, this place is hell . . . You'd better get me that aspirin. I'm cold."

"Surely." Ruiz-Sanchez went quickly back into the lab, made up a salicylate-barbiturate paste in one of the Lithians' superb mortars, and pressed it into a set of pills. He wished he could stamp each pill "Bayer" before it dried—if Cleaver's personal cure-all was aspirin, it would be just as well to let him think he was taking aspirin—but he had no dies for the purpose. He took two of the pills back to Cleaver with a mug and a carafe of Berkeley-filtered water.

The big man was already asleep; Ruiz-Sanchez woke him. Cleaver would sleep longer and awake farther along the road to recovery if he were done that small unkindness now. As it was, he hardly noticed when the pills were put down him, and soon resumed his heavy, troubled breathing.

That done, Ruiz-Sanchez returned to the front room of the house, sat down, and began to inspect the jungle suit. The tear which the plant spine had made

was not difficult to find, and would be easy to repair. It would be much harder to repair Cleaver's notion that their defenses were invulnerable, and that plants could be blundered against with impunity. Ruiz-Sanchez wondered if one or both of the other members of the Commission still shared that notion.

Cleaver had called the thing which had brought him low a "pineapple." Any biologist could have told Cleaver that even on Earth the pineapple is a prolific and dangerous weed, edible only by a happy and irrelevant accident. In Hawaii, as Ruiz-Sanchez remembered, the tropical forest was quite impossible to anyone not wearing heavy boots and tough trousers. The close-packed, irrepressible pineapples outside of the plantations could tear unprotected legs to ribbons.

The Jesuit turned the suit over. The zipper that Cleaver had jammed was made of a plastic into the molecule of which had been incorporated radicals from various Terrestrial anti-fungal substances, chiefly thiolutin. The fungi of Lithia respected these, all right, but the elaborate molecule of the plastic itself had a tendency, under Lithian humidities and heats, to undergo polymerization more or less spontaneously. That was what had happened here. One of the teeth of the zipper had changed into something resembling a piece of popcorn.

IT GREW slowly dark as Ruiz-Sanchez worked. There was a muted puff of sound, and the room was illuminated with small, soft

yellow flames from recesses in every wall. The burning substance was natural gas, of which Lithia had an inexhaustible and constantly renewed supply. The flames were lit by adsorption against a catalyst, as soon as the gas came on. A lime mantle, which worked on a rack and pinion of heatproof glass, could be moved into the flame to provide a brighter light; but the priest liked the yellow light the Lithians themselves preferred, and used the lime-light only in the laboratory.

For some things, of course, the Earthmen had to have electricity, for which they had been forced to supply their own generators. The Lithians had a far more advanced science of electrostatics than Earth had, but of electrodynamics they knew comparatively little. They had discovered magnetism only a few years before, since natural magnets were unknown on the planet. They had first observed the phenomenon, not in iron, of which they had next to none, but in liquid oxygen—a difficult substance from which to make generator coil cores!

The results in terms of Lithian civilization were peculiar, to an Earthman. The tall, reptilian people had built several huge electrostatic generators and scores of little ones, but had nothing even vaguely resembling telephones. They knew a great deal on the practical level about electrolysis, but carrying a current over a long distance—say one kilometer—was regarded by them as impossible. They had no electric motors as an Earthman would understand the term, but made fast intercontinental flights in jet aircraft powered by static elec-

tricity. Cleaver said he understood this feat, but Ruiz-Sanchez certainly did not.

They had a completely marvelous radio network, which among other things provided a "live" navigational grid for the whole planet, zeroed on (and here perhaps was the epitome of the Lithian genius for paradox) a tree. Yet they had never produced a commercial vacuum tube and their atomic theory was not much more sophisticated than Democritus' had been!

These paradoxes, of course, could be explained in part by the things that Lithia lacked. Like any large rotating mass, Lithia had a magnetic field of its own, but a planet which almost entirely lacks iron provides its people with no easy way to discover magnetism. Radioactivity, at least until the Earthmen had arrived, had been entirely unknown on the surface of Lithia, which explained the hazy atomic theory. Like the Greeks, the Lithians had discovered that friction between silk and glass produces one kind of charge, and between silk and amber another. They had gone on from there to Widmanstätten generators, electrochemistry, and the static jet—but without suitable metals they were unable to make batteries or do more than begin to study electricity in motion.

In the fields where they had been given fair clues, they had made enormous progress. Despite the constant cloudiness and endemic drizzle, their descriptive astronomy was excellent, thanks to the fortunate presence of a small moon which had drawn their attention outward early. This in turn made for basic

advances in optics. Their chemistry took full advantage of both the seas and the jungles. From the one they took such vital and diversified products as agar, iodine, salt, trace metals, and foods of many kinds. The other provided nearly everything else that they needed: resins, rubbers, woods of all degrees of hardness, edible and essential oils, vegetable "butters," rope and other fibers, fruits and nuts, tannins, dyes, drugs, cork, paper. Indeed, the sole forest product which they did not take was game, and the reason for this oversight was hard to find. It seemed to the Jesuit to be religious—yet the Lithians had no religion, and they certainly ate many of the creatures of the sea without qualms of conscience.

HE DROPPED the jungle suit into his lap with a sigh, though the popcorned tooth still was not completely trimmed back into shape. Outside, in the humid darkness, Lithia was in full concert. It was a vital, somehow fresh, new-sounding drone, covering most of the sound spectrum audible to an Earthman. It came from the myriad insects of Lithia. Many of these had wiry, ululating songs, almost like birds, in addition to the scrapes and chirrups and wing-buzzes of the insects of Earth.

Had Eden sounded like that, before evil had come into the world? Ruiz-Sanchez wondered. Certainly his native Peru sang no such song. Qualms of conscience—these were, in the long run, his essential business, rather than the taxonomical jungles of biology, which had al-

ready become tangled into near-hopelessness on Earth before space-flight had come along to add whole new volumes of puzzles. It was only interesting that the Lithians were bipedal reptiles with marsupial-like pouches and pteropoid circulatory systems. But it was vital that they had qualms of conscience—if they did.

He and the other three men were on Lithia to decide whether or not Lithia would be suitable as a port of call for Earth, without risk of damage to either Earthmen or Lithians. The other three men were primarily scientists, but Ruiz-Sanchez' own recommendation would in the long run depend upon conscience, not upon taxonomy.

He looked down at the still-imperfect suit with a troubled face until he heard Cleaver moan. Then he arose and left the room to the softly hissing flames.

II

FROM THE OVAL front window of the house to which Cleaver and Ruiz-Sanchez had been assigned, the land slanted away with insidious gentleness toward the ill-defined south edge of Lower Bay, a part of the Gulf of Sfath. Most of the area was salt marsh, as was the sea-side nearly everywhere on Lithia. When the tide was in, the flats were covered to a depth of a meter or so almost half the way to the house. When it was out, as it was tonight, the jungle symphony was augmented by the agonized barking of a score of species of lungfish. Occasionally,

when the small moon was unoccluded and the light from the city was unusually bright, one could see the leaping shadow of some amphibian, or the sinuously advancing sigmoid track of the Lithian crocodile, in pursuit of some prey faster than itself but which it would nonetheless capture in its own geological good time.

Still farther—and usually invisible even in daytime because of the pervasive mists—was the opposite shore of Lower Bay, beginning with tidal flats again, and then more jungle, which ran unbroken thereafter for hundreds of kilometers to the equatorial sea.

Behind the house, visible from the sleeping room, was the rest of the city, Xoredeshch Sfath, capitol of the great southern continent. Like all the cities the Lithians built, its most striking characteristic to an Earthman was that it hardly seemed to be there at all. The Lithian houses were low, and made of the earth which had been dug from their foundations, so that they tended to fade into the soil even to a trained observer.

Most of the older buildings were rectangular, put together without mortar of rammed-earth blocks. Over the course of decades the blocks continued to pack and settle themselves until it became easier to abandon an unwanted building than to tear it down. One of the first sethacks the Earthmen had suffered on Lithia had come through an ill-advised offer to saw one such structure with TDX, a gravity-polarized explosive unknown to the Lithians. The warehouse in question was large, thick-

walled, and three Lithian centuries old. The explosion created an uproar which greatly distressed the Lithians, but when it was over, the storehouse still stood, unshaken.

Newer structures were more conspicuous when the sun was out, for just during the past half century the Lithians had begun to apply their enormous knowledge of ceramics to house construction. The new houses assumed thousands of fantastic, quasi-biological shapes, not quite amorphous but not quite resembling any form in experience either. Each one was unique and to the choice of its owner, yet all markedly shared the character of the community and the earth from which it sprang. These houses, too, would have blended well with the background of soil and jungle, except that most of them were glazed and so shone blindingly for brief moments on sunny days when the light and the angle of the observer was just right. These shifting coruscations, seen from the air, had been the Earthmen's first intimation that there was intelligent life in the ubiquitous Lithian jungle.

Ruiz-Sanchez looked out the sleeping-room window at the city for at least the ten thousandth time on his way to Cleaver's hammock. Xoredeshch Sfath was alive to him; it never looked the same twice. He found it singularly beautiful.

He checked Cleaver's pulse and respiration. Both were fast, even for Lithia, where a high carbon dioxide partial pressure raised the pH of the blood of Earthmen to an abnormal level and stimulated the breathing reflex. The priest judged, however, that Cleaver was in little

danger as long as his actual oxygen utilization was not increased. At the moment he was certainly sleeping deeply—if not very restfully—and it would do no harm to leave him alone for a little while.

Of course, if a wild allosaur should blunder into the city . . . But that was about as likely as the blundering of an untended elephant into the heart of New Delhi. It could happen, but almost never did. And no other dangerous Lithian animal could break into the house if it were sealed.

RUIZ-SANCHEZ checked the carafe of fresh water in the niche beside the hammock, went into the hall, and donned boots, macintosh and waterproof hat. The night sounds of Lithia burst in upon him as he opened the stone door, along with a gust of sea air and the characteristic halogen odor most people call "salty." There was a thin drizzle falling, making haloes around the lights of Xoredeshch Sfath. Far out, on the water, another light moved. That was probably the coastal side-wheeler to Ylith, the enormous island which stood athwart the Upper Bay, barring the Gulf of Sfath as a whole from the equatorial sea.

Outside, Ruiz-Sanchez turned the wheel which extended bolts on every margin of the door. Drawing from his macintosh a piece of soft chalk, he marked on the sheltered tablet designed for such uses the Lithian symbols which meant "Illness is here." That would be sufficient. Anybody who chose to could open the door simply by turning

the wheel, but the Lithians were overridingly social beings, who respected their own conventions as they would respect natural law.

That done, Ruiz-Sanchez set out for the center of the city and the Message Tree. The asphalt streets shone in the yellow lights cast from windows, and in the white light of the mantled, wide-spaced street lanterns. Occasionally he passed the eight-foot, kangaroo-like shape of a Lithian, and the two exchanged glances of frank curiosity, but there were not many Lithians abroad now. They kept to their houses at night, doing Ruiz-Sanchez knew not what. He could see them frequently, alone or by twos or threes, moving behind the oval windows of the houses he passed. Sometimes they seemed to be talking.

What about?

It was a nice question. The Lithians had no crime, no newspapers, no household communications system, no arts that could be differentiated clearly from their crafts, no political parties, no public amusements, no nations, no games, no religions, no sports, no celebrations. Surely they didn't spend every waking minute of their lives exchanging knowledge, discussing philosophy or history? Or did they? Perhaps, Ruiz-Sanchez thought suddenly, they simply went inert once they were inside their jugs, like so many pickles! But even as the thought came, the priest passed another house, and saw their silhouettes moving to and fro . . .

A puff of wind scattered cool droplets in his face. Automatically, he quickened his step. If the night were to turn out especially windy,

there would doubtless be many voices coming and going in the Message Tree. It loomed ahead of him now, a sequoia-like giant, standing at the mouth of the valley of the River Sfath—the valley which led in great serpentine folds into the heart of the continent, where Gleshchek Sfath, or Blood Lake in English, poured out its massive torrents.

As the winds came and went along the valley, the tree nodded and swayed. With every movement, the tree's root system, which underlay the entire city, tugged and distorted the buried crystalline cliff upon which the city had been founded, as long ago in Lithian prehistory as was the founding of Rome on Earth. At every such pressure, the buried cliff responded with a vast heart-pulse of radio waves—a pulse detectable not only all over Lithia, but far out in space as well.

These hurst, of course, were sheer noise. How the Lithians modified them to carry information—not only messages, but the amazing navigational grid, the planet-wide time-signal system, and much more—was something Ruiz-Sanchez never expected to learn, although Cleaver said it was all perfectly simple once you understood it. It had something to do with semi-conduction and solid-state physics, which—again according to Cleaver—the Lithians understood better than any Earthman.

Almost all knowledge, Ruiz-Sanchez reflected with amusement, fell into that category. It was either perfectly simple once you understood it, or else it fell apart into fiction. As a Jesuit—even here, 40

light-years from Rome—Ruiz-Sanchez knew something about knowledge that Cleaver would never learn: that all knowledge goes through both stages, the annunciation out of noise into fact and the disintegration back into noise again. The process involved was the making of increasingly finer distinctions. The outcome was an endless series of theoretical catastrophes. The residuum was faith.

THE HIGH, sharply vaulted chamber, like an egg stood on its large end, which had been burned out in the base of the Message Tree was droning with life as Ruiz-Sanchez entered it. It would have been difficult to imagine anything less like an Earthly telegraph office or other message center, however.

Around the circumference of the lower end of the egg there was a continual whirling of tall figures, Lithians entering and leaving through the many doorless entrances and changing places in the swirl of movement like so many electrons passing from orbit to orbit. Despite their numbers, their voices were pitched so low that Ruiz-Sanchez could hear blended in with their murmuring the sighing of the wind through the enormous branches far aloft.

The inner side of this band of moving figures was bounded by a high railing of black, polished wood, evidently cut from the phloem of the tree itself. On the other side of this Encke's Division a thin circlet of Lithians took and passed out messages steadily and

without a moment's break, handling the total load faultlessly—if one were to judge by the way the outer band was kept in motion—and without apparent effort by memory alone. Occasionally one of these specialists would leave the circlet and go to one of the desks which were scattered over most of the rest of the sloping floor, increasingly thinly, like a Crêpe Ring, to confer there with the desk's occupant. Then he went back to the black rail, or, sometimes, he took the desk and its previous occupant went to the rail.

The bowl deepened, the desks thinned, and at the very center stood a single, aged Lithian, his hands clapped to the ear-whois behind his heavy jaws, his eyes covered by their nictitating membrane, only his nasal fossae and heat-receptive postnasal pits uncovered. He spoke to no one, and no one consulted him—but the absolute stasis in which he stood was obviously the reason, the sole reason, for the torrents and counter-torrents of people which poured along the outermost ring.

Ruiz-Sanchez stopped, astonished. He had never himself been to the Message Tree before—communicating with the other two earthmen on Lithia had been, until now, one of Cleaver's tasks—and the priest found that he had no idea what to do. The scene before him was more suggestive of a bourse than of a message center in any ordinary sense. It seemed unlikely that so many Lithians could have urgent personal messages to send each time the winds were active; yet it seemed equally uncharacter-

istic that the Lithians, with their stable, abundance-based economy, should have any equivalent of stock or commodity brokerage.

There seemed to be no choice, however, but to plunge in, try to reach the polished black rail, and ask one of those who stood on the other side to try and raise Agronski or Michellis again. At worst, he supposed, he could only be refused, or fail to get a hearing at all. He took a deep breath.

Simultaneously, his left elbow was caught in a firm four-fingered grip. Letting the stored breath out again in a snort of surprise, the priest looked around and up at the solicitously bent head of a Lithian. Under the long, trap-like mouth, the being's wattles were a delicate, curious aquamarine, in contrast to its vestigial comb, which was a permanent and silvery sapphire, shot through with veins of fuchsia.

"You are Ruiz-Sanchez," the Lithian said in his own language. The priest's name, unlike that of most of the other Earthmen, fell easily in that tongue. "I know you by your robe."

This was pure chance; any Earthman out in the rain in a macintosh would have been identified as Ruiz-Sanchez, because he was the only Earthman who seemed to the Lithians to wear the same garment indoors. "I am Chtexa, the metallist, who consulted with you earlier on medicine and on your mission and other matters. We have not seen you here before. Do you wish to talk with the Tree?"

"I do," Ruiz-Sanchez said gratefully. "It is so that I am new here.

Can you explain to me what to do?"

"Yes, but not to any profit," Chtexa said, tilting his head so that his completely inky pupils shone down into Ruiz-Sanchez' eyes. "One must have observed the ritual, which is very complex, until it is habit. We have grown up with it, but you I think lack the co-ordination to follow it on the first attempt. If I may bear your message instead . . ."

"I would be most indebted. It is for our colleagues Agronski and Michellis. They are at Xoredeshch Gton on the northeast continent, at about 32° East 32° North—"

"Yes, the second benchmark, at the outlet of the Lesser Lakes; the city of the potters. And you will say?"

"That they are to join us now, here, at Xoredeshch Sfath. And that our time on Lithia is almost up."

"That me regards. But I will bear it."

CHTEXA LEAPT into the whirling crowd, and Ruiz-Sanchez was left behind, considering again his thankfulness at the pains he had taken to learn the Lithian language. Several members of the Terrestrial commission had shown a regrettable lack of interest in that tongue: "Let 'em learn English," had been Cleaver's classic formulation. Ruiz-Sanchez was all the less likely to view this idea sympathetically considering that his own native language was Spanish and his preferred foreign language German.

Agronski had taken a slightly more sophisticated stand: it was not, he said, that Lithian was too difficult to pronounce—certainly it wasn't any harder than Arabic or Russian on the soft palate—but, after all, "it's hopeless to attempt to grasp the concepts that lie behind a really alien language in the time we have to spend here, isn't it?"

To both views, Michelis had said nothing; he had simply set out to learn to read the language first, and if he found his way from there into speaking it, he would not be surprised and neither would his confreres. That was Michelis' way of doing things, thorough and un-theoretical at the same time. As for the other two approaches, Ruiz-Sanchez thought privately that it was close to criminal to allow any contact-man for a new planet ever to leave Earth with such parochial notions. Of Cleaver's tendency to refer to the Lithians themselves as "the Snakes," Ruiz-Sanchez' opinion was such as to be admissible only to his remote confessor.

And in view of what lay before him now in this egg-shaped hollow, what was Ruiz-Sanchez to think of Cleaver's conduct as communications officer for the group? Surely he could never have transmitted or received a single message through the Tree, as he had claimed to have done. Probably he had never been nearer to the Tree than the priest had been.

Of course, it went without saying that he had been in contact with Agronski and Michelis by *some* method, but that method evidently had been a private transmitter con-

cealed in his luggage. . . . Yet, physicist though he most definitely was not, Ruiz-Sanchez rejected that solution on the spot; he had some idea of the practical difficulties of ham radio on a world like Lithia, swamped as it was on all wavelengths by the tremendous pulses which the Tree wrung from the buried crystalline cliff. The problem was beginning to make him feel decidedly uncomfortable.

Then Chtexa was back, recognizable not so much by any physical detail—for his wattles were now the same ambiguous royal purple as those of most of the other Lithians in the crowd—as by the fact that he was obviously bearing down upon the Earthman.

"I have sent your message," he said at once. "It is recorded at Xoredeshch Gton. But the other Earthmen are not there. They have not been in the city for some days."

That was impossible. Cleaver had said he had spoken to Agronski only a day ago. "Are you sure?" Ruiz-Sanchez said cautiously.

"It admits of no uncertainty. The house which we gave them stands empty. The many things which they had with them are gone." The tall shape raised its small hands in a gesture which might have been solicitous. "I think this is an ill word. I dislike to bring it you. The words which you brought me when we first met were full of good."

"Thank you. Don't worry," Ruiz-Sanchez said distractedly. "No man could hold the bearer responsible for the word, surely."

"Whom else would he hold responsible for it? At least that is our custom," Chtexa said. "And un-

der it, you have lost by our exchange. Your words on iron have been shown to contain great good. I would take pleasure in showing you how we have used them, especially so since I have brought you in return an ill message. If you would share my house tonight, without prejudice to your work . . ."

Sternly Ruiz-Sanchez stifled his sudden excitement. Here was the first chance, at long last, to see something of the private life of Lithial! And through that, perhaps, gain some inkling of the moral life, the rôle in which God had cast the Lithians in the ancient drama of good and evil in the past and in the times to come. Until that was known, the Lithians in their Eden were only spuriously good: all reason, all organic thinking machines, ULTIMACs with tails and without souls.

But there was the hard fact that he had left behind a sick man. There was not much chance that Cleaver would awaken before morning; he had been given nearly 15 mg. of sedative per kilogram of

body weight. But if his burly frame should somehow throw it off, driven perhaps by some anaphylactic crisis impossible to rule out this early, he would need prompt attention. At the very least, he would want badly for the sound of a human voice on this planet which he hated and which had struck him down.

Still, the danger to Cleaver was not great. He most certainly did not require a minute-by-minute vigil. There was, after all, such a thing as an excess of devotion, a form of pride among the pious which the Church had long found peculiarly difficult to stifle. At its worst, it produced a St. Simon Stylites, who though undoubtedly acceptable to God had for centuries been very bad public relations for the Church. And had Cleaver really earned the kind of devotion Ruiz-Sanchez had been proposing, up to now, to tender him as a creature of God? And with a whole planet at stake, a whole people—

A lifetime of meditation over just such problems of conscience had made Ruiz-Sanchez, like any



other gifted member of his Order, quick to find his way through all but the most complex ethical labyrinths to a decision. An unsympathetic observer might almost have called him "agile."

"Thank you," he said, a little shakily. "I will share your house very gladly."

III

CLEAVER? Cleaver! Wake up, you big slob. Where the hell have you been?"

Cleaver groaned and tried to turn over. At his first motion, the world began to rock gently, sickeningly. His mouth was filled with burning pitch.

"Cleaver, turn out. It's me—Agronski. Where's the Father? What's wrong? Why didn't we hear from you? *Look out, you'll—*"

The warning came too late and Cleaver could not have understood it anyhow; he had been profoundly asleep and had no notion of his situation in space or time. At his convulsive twist away from the nagging voice, the hammock rotated on its hooks and dumped him.

He struck the floor stunningly, taking the main blow across his right shoulder, though he hardly felt it as yet. His feet, not yet part of him at all, still remained afloat far aloft, twisted in the hammock webbing.

"Good lord!" There was a brief chain of footsteps, like chestnuts dropping on a roof, and then an overstated crash. "Cleaver, are you sick? Here, lie still a minute and let me get your feet free. Mike—Mike,

can't you turn the gas up in this jug? Something's wrong back here."

After a moment, yellow light began to pour from the glistening walls. Cleaver dragged an arm across his eyes, but it did him no good; it tired too quickly. Agronski's mild face, plump and anxious, floated directly above him like a captive balloon. He could not see Michéls anywhere, and at the moment he was just as glad. Agronski's presence was hard enough to understand.

"How . . . the hell . . ." he said. At the words, his lips split painfully at both corners. He realized for the first time that they had become gummed together, somehow, while he was asleep. He had no idea how long he had been out of the picture.

Agronski seemed to understand the aborted question. "We came in from the Lakes in the 'copter," he said. "We didn't like the silence down here and we figured that we'd better come in under our own power, instead of registering in on the regular jetliner and tipping the Lithians off—just in case there'd been any dirty work afloat."

"Stop jawing him," Michéls said, appearing suddenly, magically in the doorway. "He's got a bug, that's obvious. I don't like to feel pleased about misery, but I'm glad it's that instead of the Lithians."

The rangy, long-jawed chemist helped Agronski lift Cleaver to his feet. Tentatively, despite the pain, Cleaver got his mouth open again. Nothing came out but a hoarse croak.

"Shut up," Michéls said, not unkindly. "Let's get him back into

the hammock. Where's the Father? He's the only one capable of dealing with sickness here."

"I'll bet he's dead," Agronski burst out suddenly, his face glistening with alarm. "He'd be here if he could. It must be catching, Mike."

"I didn't bring my mitt," Michelis said drily. "Cleaver, lie still or I'll have to clobber you. Agronski, you seem to have dumped his water carafe; better go get him some more, he needs it. And see if the Father left anything in the lab that looks like 'medicine.'"

Agronski went out, and, maddeningly, so did Michelis—at least out of Cleaver's field of vision. Setting his every muscle against the pain, Cleaver pulled his lips apart once more.

"Mike."

Instantly, Michelis was there. He had a pad of cotton between two fingers, wet with some solution, with which he gently cleaned Cleaver's lips and chin.

"Easy. Agronski's getting you a drink. We'll let you talk in a little while, Paul. Don't rush it."

Cleaver relaxed a little. He could trust Michelis. Nevertheless, the vivid and absurd insult of having to be swabbed like a baby was more than he could bear; he felt tears of helpless rage swelling on either side of his nose. With two deft, non-committal swipes, Michelis removed them.

Agronski came back, holding out one hand tentatively, palm up. "I found these," he said. "There's more in the lab, and the Father's pillpress is still out. So's his mortar and pestle, though they've been cleaned."

"All right, let's have 'em," Michelis said. "Anything else?"

"No. There's a syringe cooking in the sterilizer, if that means anything."

Michelis swore briefly and to the point. "It means that there's a pertinent antitoxin in the shop someplace," he added. "But unless Ramon left notes, we'll not have a prayer of figuring out which one it is."

As he spoke, he lifted Cleaver's head and tipped the pills into his mouth. The water which followed was cold at the first contact, but a split second later it was liquid fire. Cleaver choked, and at that precise moment Michelis pinched his nostrils shut. The pills went down.

"There's no sign of the Father?" Michelis said.

"Not a one, Mike. Everything's in good order, and his gear's still here. Both jungle suits are in the locker."

"Maybe he went visiting," Michelis said thoughtfully. "He must have gotten to know quite a few of the Lithians by now."

"With a sick man on his hands? That's not like him, Mike. Not unless there was some kind of emergency. Or maybe he went on a routine errand, expected to be back in just a few moments, and—"

"And was set upon by trolls for forgetting to stamp his foot three times before crossing the bridge."

"All right, laugh."

"I'm not laughing, believe me."

"Mike . . ."

Michelis took a step back and looked down at Cleaver, his face floating as if detached through a haze of tears. He said: "All right,

Paul. Tell us what it is. We're listening."

But it was too late. The doubled barbiturate dose had gotten to Cleaver first. He could only shake his head, and with the motion Michellis seemed to go reeling away into a whirlpool of fuzzy rainbows.

CURIOUSLY, he did not quite go to sleep. He had had nearly a normal night's sleep, and he had started out the enormously long day a powerful and healthy man. The conversation of the two Earthmen and an obsessive consciousness of his need to speak to them before Ruiz-Sanchez returned helped to keep him, if not totally awake, at least not far below a state of light trance—and the presence in his system of 30 grains of acetylsalicylic acid had seriously raised his oxygen consumption, bringing with it not only dizziness but a precarious, emotionally untethered alertness. That the fuel which was being burned to maintain it was largely the protein substrate of his own cells he did not know, and it could not have alarmed him had he known it.

The voices continued to reach him, and to convey a little meaning. With them were mixed fleeting, fragmentary dreams, so slightly removed from the surface of his waking life as to seem peculiarly real, yet at the same time peculiarly pointless and depressing. In the semi-conscious intervals there came plans, a whole succession of them, all simple and grandiose at once, for taking command of the expedition, for communicating with the authorities on Earth, for bringing forward

secret papers proving that Lithia was uninhabitable, for digging a tunnel under Mexico to Peru, for detonating Lithia in one single mighty fusion of all its light-weight atoms into an atom of cleaverium, the element whose cardinal number was aleph-null. . .

ACONSKI: Mike, come here and look at this; you read Lithian. There's a mark on the front door, on the message tablet.

(Footsteps.)

MICHELLIS: It says "Sickness inside." The strokes aren't casual or deft enough to be the work of the natives. Ideographs are hard to write rapidly. Ramon must have written it there.

ACONSKI: I wish I knew where he went afterwards.

(Footsteps. Door shutting, not loudly. Footsteps. Hassock creaking.)

ACONSKI: Well, we'd better be thinking about getting up a report. Unless this damn 20-hour day has me thrown completely off, our time's just about up. Are you still set on opening up the planet?

MICHELLIS: Yes. I've seen nothing to convince me that there's anything on Lithia that's dangerous to us. Except maybe Cleaver in there, and I'm not prepared to say that the Father would have left him if he were in any serious danger. And I don't see how Earthmen could harm this society: it's too stable emotionally, economically, in every other way.

(*Danger, danger, said somebody in Cleaver's dream. It will explode. It's all a popish plot.* Then he was marginally awake again and conscious of how his mouth hurt.)

AGRONSKI: Why do you suppose these two jokers never called us after we went north?

MICHELIS: I don't have any answer. I won't even guess until I talk to Ramon. Or until Paul's able to sit up and take notice.

AGRONSKI: I don't like it, Mike. It smells bad to me. This town's right at the heart of the communications system of the planet. And yet—no messengers, Cleaver sick, the Father not here . . . There's a hell of a lot we don't know about Lithia.

MICHELIS: There's a hell of a lot we don't know about central Brazil.

AGRONSKI: Nothing essential, Mike. What we know about the periphery gives us all the clues we need about the interior—even to those fish that eat people, the what are they, the pirhanas. That's not true on Lithia. We don't know whether our peripheral clues about Lithia are germane or just incidental. Something enormous could be hidden under the surface without our being able to detect it.

MICHELIS: Agronski, stop sounding like a Sunday supplement. You underestimate your own intelligence. What kind of enormous secret could that be? That the Lithians eat people? That they're cattle for unknown gods that live in the jungle? That they're actually mind-wrenching, soul-twisting, heart-stopping, bowel-moving intelligences in disguise? The moment you state any such proposition, you'll deflate it yourself. I wouldn't even need to take the trouble of examining it, or discussing how we might meet it if it were true.

AGRONSKI: All right, all right. I'll reserve judgment for the time being, anyhow. If everything turns out to be all right here, with the Father and Cleaver I mean, I'll probably go along with you. I don't have any reason I could defend for voting against the planet, I admit.

MICHELIS: Good for you. I'm sure Ramon is for opening it up, so that should make it unanimous. I can't see why Cleaver would object.

(Cleaver was testifying before a packed court convened in the UN General Assembly chambers in New York, with one finger pointed dramatically, but less in triumph than in sorrow, at Ramon Ruiz-Sanchez, S. J. At the sound of his name the dream collapsed and he realized that the room had grown a little lighter. Dawn—or the dripping, wool-grey travesty of it which prevailed on Lithia—was on its way. He wondered what he had just said to the court. It had been conclusive, damning, good enough to be used when he awoke; but he could not remember a word of it. All that remained of it was a sensation, almost the taste of the words, but with nothing of their substance.)

AGRONSKI: It's getting light. I suppose we'd better knock off.

MICHELIS: Did you stake down the 'copter? The winds here are higher than they are up north, I seem to remember.

AGRONSKI: Yes. And covered it with the tarp. Nothing left to do but sling our hammocks—

MICHELIS: Shh. What's that?

(Footsteps. Faint ones, but Cleaver knew them. He forced his eyes to open a little, but there was

nothing to see but the ceiling. Its even color, and its smooth, ever-changing slope into a dome of nothingness, drew him almost immediately upward into the mists of trance once more.)

AGOROSKI: Somebody's coming. It's the Father, Mike—look out here. He seems to be all right. Dragging his feet a bit, but who wouldn't after being out helling all night?

MICHELIS: Maybe you'd better meet him at the door. It'd probably be better than our springing out at him after he gets inside. After all he doesn't expect us. I'll get to unpacking the hammocks.

AGOROSKI: Sure, Mike.

(Footsteps, going away from Cleaver. A grating sound of stone on stone: the door-wheel being turned.)

AGOROSKI: Welcome home, Father! We got in just a little while ago and—what's wrong? Are you ill? Is there something that— Mike! Mike!

(Somebody was running. Cleaver willed his neck muscles to lift his head, but they refused to obey. Instead, the back of his head seemed to force itself deeper into the stiff pillow of the hammock. After a momentary and endless agony he cried out.)

CLEAVER: Mike!

AGOROSKI: Mike!

(With a gasp, Cleaver lost the long battle at last. He was asleep.)

IV

AS THE DOOR of Chtexa's house closed behind him, Ruiz-Sanchez looked about the gently-

glowing foyer with a feeling of almost unbearable anticipation, although he could hardly have said what it was that he hoped to see. Actually, it looked exactly like his own quarters, which was all he could in justice have expected—all the furniture at "home" was Lithian except the lab equipment.

"We have cut up several of the metal meteors from our museum, and hammered them as you suggested," Chtexa said behind him, while he struggled out of his raincoat and boots. "They show very definite, very strong magnetism, just as you predicted. We now have the whole planet alerted to pick up meteorites and send them to our electrical laboratory here, regardless of where found. The staff of the observatory is attempting to predict possible falls. Unhappily, meteors are rare here. Our astronomers say that we have never had a 'shower' such as you describe as frequent on your native planet."

"No; I should have thought of that," Ruiz-Sanchez said, following the Lithian into the front room. This, too, was quite ordinary, and empty except for the two of them. "In our system we have a sort of giant grinding wheel—a whole ring of little planets, many thousands of them, distributed around an orbit where we had expected to find only one normal-sized world. Collisions between these bodies are incessant, and our plague of meteors is the result. Here I suppose you have only the usual few strays from comets."

"It is hard to understand how so unstable an arrangement could have come about," Chtexa said, sitting down and pointing out another

hassock to his guest. "Have you an explanation?"

"Not a good one," Ruiz-Sanchez said. "Some of us think that there was a respectable planet in that orbit ages ago, which exploded somehow. A similar accident happened to a satellite in our system—at least one of our planets has a similar ring. Others think that at the formation of our solar system the raw materials of what might have been a planet just never succeeded in coalescing. Both ideas have many flaws, but each satisfies certain objections to the other, so perhaps there is some truth in both."

Chtexa's eyes filmed with the mildly disquieting "inner blink" characteristic of Lithians at their most thoughtful. "There would seem to be no way to test either answer," he said at length. "By our logic, lack of such tests makes the original question meaningless."

"That rule of logic has many adherents on Earth. My colleague Dr. Cleaver would certainly agree with it," Ruiz-Sanchez smiled suddenly. He had labored long and hard to master the Lithian language, and to have understood and recognized so completely abstract a point as the one just made by Chtexa was a bigger victory than any quantitative gains in vocabulary alone could ever have been. "But I can see that we are going to have difficulties in collecting these meteorites. Have you offered incentives?"

"Oh, certainly. Everyone understands the importance of the program. We are all eager to advance it."

This was not quite what the priest had meant by his question.

He searched his memory for some Lithian equivalent of "reward," but found nothing but the word he had already used, "incentive." He realized that he knew no word for "greed," either. Evidently offering Lithians a hundred dollars a meteorite would simply baffle them. Instead he said, "Since the potential meteor-fall is so small, you're not likely to get anything like the supply of metal that you need for a real study, no matter how thoroughly you cooperate on it. You need a supplementary iron-finding program: some way of concentrating the traces of the metal you have on the planet. Our smelting methods would be useless to you, since you have no ore-beds. Hmm. What about the iron-fixing bacteria?"

"Are there such?" Chtexa said, cocking his head dubiously.

"I don't know. Ask your bacteriologists. If you have any bacteria here that belong to the genus we call *Leptothrix*, one of them should be an iron-fixing species. In all the millions of years that this planet has had life on it, that mutation must have occurred, and probably very early."

"But why have we never seen it before? We have done perhaps more research in bacteriology than we have in any other field."

"Because," Ruiz-Sanchez said earnestly, "you didn't know what to look for, and because such a species would be as rare as iron itself. On Earth, because we have iron in abundance, our *Leptothrix ochracea* has found plenty of opportunity to grow. We find their fossil sheaths by uncountable millions in our great ore-beds. It used to be

thought, as a matter of fact, that the bacteria *produced* the ore-beds, but I've never believed that. While they do obtain their energy by oxidizing ferrous iron, such salts in solution change spontaneously to ferric salts if the oxidation-reduction potential and the pH of the water are right—and those are conditions that are affected by ordinary decay bacteria. On our planet the bacteria grew in the ore-beds because the iron was there, not the other way around. In your case, you just don't have the iron to make them numerous, but I'm sure there must be a few."

"We will start a soil-sampling program at once," Chtexa said, his wattles flaring a subdued orchid. "Our antibiotics research centers screen soil samples by the thousands every month, in search of new microflora of therapeutic importance. If these iron-fixing bacteria exist, we are certain to find them eventually."

"They must exist," Ruiz-Sánchez repeated. "Do you have a bacterium that is a sulfur-concentrating obligate anaerobe?"

"Yes—yes, certainly!"

"There you are," the Jesuit said, leaning back contentedly and clasping his hands across one knee. "You have plenty of sulfur and so you have the bacterium. Please let me know when you find the iron-fixing species. I'd like to make a subculture and take it home with me when I leave. There are two Earthmen whose noses I'd like to rub in it."

The Lithian stiffened and thrust his head forward a little, as if baffled. Ruiz-Sánchez said hastily, "Pardon me. I was translating lit-

erally an aggressive idiom of my own tongue. It was not meant to describe an actual plan of action."

"I think I understand," Chtexa said. Ruiz-Sánchez wondered if he did. In the rich storehouse of the Lithian language he had yet to discover any metaphors, either living or dead. Neither did the Lithians have any poetry or other creative arts. "You are of course welcome to any of the results of this program which you would honor us by accepting. One problem in the social sciences which has long puzzled us is just how one may adequately honor the innovator. When we consider how new ideas change our lives, we despair of giving in kind, and it is helpful when the innovator himself has wishes which society can gratify."

Ruiz-Sánchez was at first not quite sure he had understood the proposition. After he had gone over it once more in his mind, he was not sure that he could bring himself to like it, although it was admirable enough. From an Earthman it would have sounded intolerably pompous, but it was evident that Chtexa meant it.

It was probably just as well that the Commission's report on Lithia was about to fall due. Ruiz-Sánchez had begun to think that he could absorb only a little more of this kind of calm sanity. And all of it—a disquieting thought from somewhere near his heart reminded him—all of it derived from reason, none from precept, none from faith. The Lithians did not know God. They did things rightly, and thought righteously, because it was reasonable and efficient and natural

to do and to think that way. They seemed to need nothing else.

Or could it be that they thought and acted as they did because, not being born of man, and never in effect having left the Garden in which they lived, they did not share the terrible burden of original sin? The fact that Lithia had never once had a glacial epoch, that its climate had been left unchanged for 700 million years, was a geological fact that an alert theologist could scarcely afford to ignore. Could it be that, free from the burden, they were also free from the curse of Adam?

And if they were—could men bear to live among them?

I HAVE SOME questions to ask you, Chtxa," the priest said after a moment. "You owe me no debt whatsoever, but we four Earthmen have a hard decision to make shortly. You know what it is. And I don't believe that we know enough yet about your planet to make that decision properly."

"Then of course you must ask questions," Chtxa said immediately. "I will answer, wherever I can."

"Well then—do your people die? I see you have the word, but perhaps it isn't the same as our word in meaning."

"It means to stop changing and to go back to existing," Chtxa said. "A machine exists, but only a living thing, like a tree, progresses along a line of changing equilibriums. When that progress stops, the entity is dead."

"And that happens to you?"

"It always happens. Even the great trees, like the Message Tree, die sooner or later. Is that not true on Earth?"

"Yes," Ruiz-Sanchez said, "yes, it is. For reasons it would take me a long time to explain, it occurred to me that you might have escaped this evil."

"It is not evil as we look at it," Chtxa said. "Lithia lives because of death. The death of leaves supplies our oil and gas. The death of some creatures is always necessary for the life of others. Bacteria must die, and viruses be prevented from living, if illness is to be cured. We ourselves must die simply to make room for others, at least until we can slow the rate at which our people arrive in the world—a thing impossible to us at present."

"But desirable, in your eyes?"

"Surely desirable," Chtxa said. "Our world is rich, but not inexhaustible. And other planets, you have taught us, have peoples of their own. Thus we cannot hope to spread to other planets when we have over-populated this one."

"No real thing is ever inexhaustible," Ruiz-Sanchez said abruptly, frowning at the iridescent floor. "That we have found to be true over many thousands of years of our history."

"But inexhaustible in what way?" said Chtxa. "I grant you that any small object, any stone, any drop of water, any bit of soil can be explored without end. The amount of information which can be gotten from it is quite literally infinite. But a given soil can be exhausted of nitrates. It is difficult, but with bad cultivation it can be done. Or

take iron, about which we have already been talking. Our planet's supply of iron has limits which we already know, at least approximately. To allow our economy to develop a demand for iron which exceeds the total known supply of lithia—and exceeds it beyond any possibility of supplementation by meteors or by import—would be folly. This is not a question of information. It is a question of whether or not the information can be used. If it cannot, then limitless information is of no help."

"You could certainly get along without more iron if you had to," Ruiz-Sanchez admitted. "Your wooden machinery is precise enough to satisfy any engineer. Most of them, I think, don't remember that we used to have something similar: I've a sample in my own home. It's a kind of timer called a cuckoo clock, nearly two of our centuries old, made entirely of wood, and still nearly 100% accurate. For that matter, long after we began to build sea-going vessels of metal, we continued to use *lignum vitae* for ships' bearings."

"Wood is an excellent material for most uses," Chitexa agreed. "Its only deficiency, compared to ceramic materials or perhaps metal, is that it is variable. One must know it well to be able to assess its qualities from one tree to the next. And of course complicated parts can always be grown inside suitable ceramic molds; the growth pressure inside the mold rises so high that the resulting part is very dense. Larger parts can be ground direct from the plank with soft

sandstone and polished with slate. It is a gratifying material to work, we find."

Ruiz-Sanchez felt, for some reason, a little ashamed. It was a magnified version of the same shame he had always felt at home toward that old Black Forest cuckoo clock. The electric clocks elsewhere in his villa back home all should have been capable of performing silently, accurately and in less space—but the considerations which had gone into the making of them had been commercial as well as purely technical. As a result, most of them operated with a thin, asthmatic whirr, or groaned softly but dismally at irregular hours. All of them were "streamlined," oversized and ugly. None of them kept good time, and several of them, since they were powered by constant-speed motors operating very simple gear-boxes, could not be adjusted, but had been sent out from the factory with built-in, inflexible inaccuracies.

The wooden cuckoo clock, meanwhile, ticked evenly away. A quail emerged from one of two wooden doors every quarter of an hour and let you know about it, and on the hour first the quail came out, then the cuckoo, and there was a soft bell that rang just ahead of the cuckoo's call. It was accurate to a minute a week, all for the price of running up the three weights which drove it, each night before bedtime.

The maker had been dead before Ruiz-Sanchez had been born. In contrast, the priest would probably buy and jettison at least a dozen cheap electric clocks in the course

of one lifetime, as their makers had intended he should.

"I'M SURE it is," he said humbly. "I have one more question, if I may. It is really part of the same question: I have asked if you die; now I should like to ask how you are born. I see many adults on your streets and sometimes in your houses—though I gather you yourself are alone—but never any children. Can you explain this to me? Or if the subject is not allowed to be discussed . . ."

"But why should it not be? There can never be any closed subjects," Chtexa said. "You know, of course, that our mates have abdominal pouches where the eggs are carried. It was a lucky mutation for us, for there are a number of nest-robbing species on this planet."

"Yes, we have a few animals with a somewhat similar arrangement on Earth, although they are live-bearers."

"Our eggs are laid into these pouches once a year," Chtexa said. "It is then that the women leave their own houses and seek out the male of their choice to fertilize the eggs. I am alone because, thus far, I am no woman's first choice this season. In contrast you may see men's houses at this time of year which shelter three or four women who favor him."

"I see," Ruiz-Sanchez said carefully. "And how is the choice determined? Is it by emotion, or by reason alone?"

"The two are in the long run the same," Chtexa said. "Our ancestors

did not leave our genetic needs to chance. Emotion with us no longer runs counter to our eugenic knowledge. It cannot, since it was itself modified to follow that knowledge by selective breeding for such behaviour.

"At the end of the season, then, comes Migration Day. At that time all the eggs are fertilized, and ready to hatch. On that day—you will not be here to see it, I am afraid, for your announced date of departure precedes it by a short time—our whole nation goes to the seashores. There, with the men to protect them from predators, the women wade out to swimming depth, and the children are born."

"In the sea?" Ruiz-Sanchez said faintly.

"Yes, in the sea. Then we all return, and resume our other affairs until the next mating season."

"But—but what happens to the children?"

"Why, they take care of themselves, if they can. Of course many perish, particularly to our voracious brother the great fish-lizard, whom for that reason we kill when we can. But a majority return when the time comes."

"Return? Chtexa, I don't understand. Why don't they drown when they are born? And if they return, why have we never seen one?"

"But you have," Chtexa said. "And you have heard them often. Here, come with me." He arose and led the way out into the foyer. Ruiz-Sanchez followed, his head whirling with conjecture.

Chtexa opened the door. The night, the priest saw with a subdued shock, was on the wane; there

was the faintest of pearly glimmers on the cloudy sky to the east. The multifarious humming and singing of the jungle continued unabated. There was a high, hissing whistle, and the shadow of a pterodon drifted over the city toward the sea. From the mudflats came a hoarse barking.

"There," Chtexa said softly. "Did you hear it?"

The stranded creature, or another of his kind—it was impossible to tell which—croaked protestingly again.

"It is hard for them at first," Chtexa said. "But actually the worst of their dangers are over. They have come ashore."

"Chtexa," Ruiz-Sanchez said. "Your children—the lungfish?"

"Yes," Chtexa said. "Those are our children."

V

IN THE LAST analysis it was the incessant barking of the lungfish which caused Ruiz-Sanchez to faint when Agronski opened the door for him. The late hour, and the dual strains of Cleaver's illness and the subsequent discovery of Cleaver's direct lying, contributed. So did the increasing sense of guilt toward Cleaver which the priest had felt while walking home under the gradually-brightening, weeping sky; and so, of course, did the shock of discovering that Agronski and Michelis had arrived sometime during the night while he had been neglecting his charge.

But primarily it was the diminishing, gasping clamor of the chil-

dren of Lithia, battering at his every mental citadel, all the way from Chtexa's house to his own.

The sudden fugue only lasted a few moments. He fought his way back to consciousness to find that Agronski and Michelis had propped him up on a stool in the lab and were trying to remove his macintosh without unbalancing him or awakening him—as difficult a problem in topology as removing a man's vest without taking off his jacket. Wearily, the priest pulled his own arm out of a macintosh sleeve and looked up at Michelis.

"Good morning, Mike. Please excuse my bad manners."

"Don't be an idiot," Michelis said evenly. "You don't have to talk now, anyhow. I've already spent much of tonight trying to keep Cleaver quiet until he's better. Don't put me through it again, Ramon, please."

"I won't. I'm not ill; I'm just very tired and a little overwrought."

"What's the matter with Cleaver?" Agronski demanded. Michelis made as if to shoo him off.

"No, no, Mike, I'm all right, I assure you. As for Paul, he got a dose of glucoside poisoning when a plant-spine stabbed him this afternoon. No, it's yesterday afternoon now. How has he been since, you arrived?"

"He's sick," Michelis said. "Since you weren't here, we didn't know what to do. We settled for two of the pills you'd left out."

"You did?" Ruiz-Sanchez slid his feet heavily to the floor and tried to stand up. "As you say, you couldn't have known what else to do, but I think I'd better look in on him—"

"Sit down, please, Ramon." Michelis spoke gently, but his tone showed that he meant the request to be honored. Obscurely glad to be forced to yield to the big man's well-meant implacability, the priest let himself be propped back on the stool. His boots fell off his feet to the floor.

"Mike, who's the Father here?" he said tiredly. "Still, I'm sure you've done a good job. He's in no apparent danger?"

"Well, he seems very sick. But he had energy enough to keep himself half awake most of the night. He only passed out a short while ago."

"Good. Let him stay out. Tomorrow we'll probably have to begin intravenous feeding, though. In this atmosphere one doesn't give a salicylate overdose without penalties." He sighed. "Can we put off further questions?"

"If there's nothing else wrong here, of course we can."

"Oh," Ruiz-Sanchez said, "there's a great deal wrong, I'm afraid."

"I knew it," Agronski said. "I knew damn well there was. I told you so, Mike, didn't I?"

"Is it urgent?"

"No, Mike—there's no danger to us, of that I'm positive. It's nothing that won't keep until we've all had a rest. You two look as though you need one as badly as I."

"We're tired," Michelis agreed.

"But why didn't you ever call us?" Agronski burst in aggrievedly. "You had us scared half to death, Father. If there's really something wrong here, you should have—"

"There's no immediate danger," Ruiz-Sanchez repeated patiently.

"As for why we didn't call you, I don't understand that any more than you do. Up to tonight, I thought we were in regular contact with you both. That was Paul's job and he seemed to be carrying it out. I didn't discover that he wasn't doing it until after he became ill."

"Then obviously we'll have to wait," Michelis said. "Let's hit the hammock, in God's name. Flying that 'copter through twenty-five hundred miles of fog-bank wasn't exactly restful, either; I'll be glad to turn in . . . But, Ramon—"

"Yes, Mike?"

"I have to say that I don't like this any better than Agronski does. Tomorrow we've got to clear it up, and get our Commission business done. We've only a day or so to make our decision before the ship comes and takes us off for good, and by that time we must know everything there is to know, and just what we're going to tell the Earth about it."

"Yes," Ruiz-Sanchez said. "Just as you say, Mike—in God's name."

THE PERUVIAN priest-biologist awoke before the others: actually, he had undergone far less purely physical strain than had the other three. It was just beginning to be cloudy dusk when he rolled out of his hammock and padded over to look at Cleaver.

The physicist was in coma. His face was dirty grey and looked oddly shrunken. It was high time that the neglect and inadvertent abuse to which he had been subjected was rectified. Happily, his pulse

and respiration were close to normal now.

Ruiz-Sanchez went quietly into the lab and made up a fructose IV feeding. At the same time he reconstituted a can of powdered egg into a sort of soufflé, setting it in a covered crucible to bake at the back of the little oven; that was for the rest of them.

In the sleeping chamber, the priest set up his IV stand. Cleaver did not stir when the needle entered the big vein just above the inside of his elbow. Ruiz-Sanchez taped the tubing in place, checked the drip from the inverted bottle, and went back into the lab.

There he sat, on the stool before the microscope, in a sort of suspension of feeling while the new night drew on. He was still poisoned-tired, but at least now he could stay awake without constantly fighting himself. The slowly-rising soufflé in the oven went *plup-plup, plup-plup*, and after a while a thin tendrill of aroma suggested that it was beginning to brown on top, or at least thinking about it.

Outside, it abruptly rained buckets. Just as abruptly, it stopped.

"Is that breakfast I smell, Ramon?"

"Yes, Mike, in the oven. In a few minutes now."

"Right."

Michelis went away again. On the back of the workbench, Ruiz-Sanchez saw the dark blue book with the gold stamping which he had brought with him all the way from Earth. Almost automatically he pulled it to him and opened it to page 573. It would at least give him something to think about with

which he was not personally involved.

He had quitted the text last with Anita, who "would yield to the lewdness of Honuphrius to appease the savagery of Sulla and the mercenariness of the twelve Sullivani, and (as Gilbert first suggested), to save the virginity of Felicia for Magravius"—now hold a moment, how could Felicia be considered still a virgin at this point? Ah: ". . . when converted by Michael after the death of Gillia"; that covered it, since Felicia had been guilty only of simple infidelities in the first place. ". . . but she fears that, by allowing his marital rights, she may cause reprehensible conduct between Eugenius and Jeremias. Michael, who has formerly debauched Anita, dispenses her from yielding to Honuphrius"—yes, that figured, since Michael also had had designs on Eugenius. "Anita is disturbed, but Michael comminates that he will reserve her case tomorrow for the ordinary Guglielmus even if she should practise a pious fraud during affliction which, from experience, she knows (according to Wadding) to be leading to nullity."

Well. This was all very well. It even seemed to be shaping up, for the first time. Still, Ruiz-Sanchez reflected, he would not like to have known the family hidden behind the conventional Latin aliases, or to have been the confessor to any one of them. Now then:

"Fortissa, however, is encouraged by Gregorius, Leo, Viteilius, and Macdugallius, reunitedly, to warn Anita by describing the strong chastisements of Honuphrius and the depravities (*turpissimas*) of

Canicula, the deceased wife of Mauritius, with Sulla, the simoniac, who is abnegand and repents."

Yes, it added up, when one tried to view it without outrage either at the persons involved—and there was every assurance that these were fictitious—or at the author, who for all his mighty intellect, the greatest perhaps of the preceding century among novelists, had still to be pitied as much as the meanest victim of the Evil One. To view it, as it were, in a sort of grey twilight of emotion, wherein everything, even the barnacle-like commentaries which the text had accumulated, could be seen in the same light.

"Is it done, Father?"

"Smells like it, Agronki. Take it out and help yourself, why don't you?"

"Thanka. Can I bring Cleaver—"

"No, he's getting an IV."

Unless his impression that he understood the problem at last was once more going to turn out to be an illusion, he was now ready for the basic question, the stumper that had deeply disturbed both the Order and the Church for so many years now. He reread it carefully. It asked:

"Has he hegemony and shall she submit?"

To his astonishment, he saw as if for the first time that it was two questions, despite the omission of a comma between the two. And so it demanded two answers. Did Honuphrius have hegemony? Yes, he did, for Michael, the only member of the whole complex who had been gifted from the beginning with the power of grace, had been egregiously com-

promised. Therefore, Honuphrius regardless of whether his sins were all to be laid at his door or were real only in rumor could not be divested of his privileges by anyone. But should Anita submit? No, she should not. Michael had forfeited his right to dispense or to reserve her in any way, and so she could not be guided by the curate or by anyone else in the long run but her own conscience—which in view of the grave accusations against Honuphrius could lead her to no recourse but to deny him. As for Sulla's repentance, and Felicia's conversion, they meant nothing, since the defection of Michael had deprived both of them, and everyone else, of spiritual guidance.

The answer, then, had been obvious all the time. It was: Yes, and No.

HE CLOSED the book and looked up across the bench, feeling neither more nor less dazed than he had before, but with a small stirring of elation deep inside him which he could not suppress. As he looked out of the window into the dripping darkness, a familiar, sculpturesque head and shoulders moved into the truncated tetrahedron of yellow light being cast out through the fine glass into the rain.

It was Chtexa, moving away from the house.

Suddenly Ruiz-Sanchez realized that nobody had bothered to rub away the sickness ideograms on the door-tablet. If Chtexa had come here on some errand, he had been turned back unnecessarily. The

priest leaned forward, snatched up an empty slide-box, and rapped with a corner of it against the inside of the window.

Chitexa turned and looked in through the steaming curtains of rain, his eyes completely filmed. Ruiz-Sanchez beckoned to him, and got stiffly off the stool to open the door. In the oven his share of breakfast dried slowly and began to burn.

The rapping had summoned forth Agronski and Michelis as well. Chitexa looked down at the three of them with easy gravity, while drops of water ran like oil down the minute, prismatic scales of his supple skin.

"I did not know that there was sickness here," the Lithian said. "I called because your brother Ruiz-Sanchez left my house this morning without the gift I had hoped to give him. I will leave if I am invading your privacy in any way."

"You are not," Ruiz-Sanchez assured him. "And the sickness is only a poisoning, not communicable and we think not likely to end badly for our colleague. These are my friends from the north, Agronski and Michelis."

"I am happy to see them. The message was not in vain, then?"

"What message is this?" Michelis said, in his pure but hesitant Lithian.

"I sent a message, as your colleague Ruiz-Sanchez asked me to do, last night. I was told by Xoredeshch Gion that you had already departed."

"As we had," Michelis said. "Ramon, what's this? I thought you told us that sending messages was

Paul's job. And you certainly implied that you didn't know how to do it after Paul took sick."

"I didn't. I don't. I asked Chitexa to send it for me."

Michelis looked up at the Lithian. "What did the message say?" he asked.

"That you were to join them now, here, in Xoredeshch Sfath. And that your time on our world was almost up."

"What does that mean?" Agronski said. He had been trying to follow the conversation, but he was not much of a linguist, and evidently the few words he had been able to pick up had served only to inflame his ready fears. "Mike, translate, please."

Michelis did so, briefly. Then he said: "Ramon, was that really all you had to say to us, especially after what you had found out? We knew that departure time was coming, too, after all. We can keep a calendar as well as you, I hope."

"I know that, Mike. But I had no idea what previous messages you'd received, if indeed you'd received any. For all I knew, Cleaver might have been in touch with you some other way, privately. I thought at first of a transmitter in his personal luggage, but later it occurred to me that he might have been sending dispatches over the regular jetliners. Or he might have told you that we were going to stay on beyond the official time. He might have told you I was dead. He might have told you anything. I had to be sure you'd arrive here regardless of what he had or had not said."

"And when I got to the local

message center, I had to revise my message again, because I found that I couldn't communicate with you directly, or send anything at all detailed. Everything that goes out from Xoredeshch Sfath by radio goes out through the Tree, and until you've seen it you haven't any idea what an Earthman is up against there in sending even the simplest message."

"Is that true?" Michelis asked Chtexa.

"True?" Chtexa repeated. "It is accurate, yes."

"Well, then," Ruiz-Sanchez said, a little nettled, "you can see why, when Chtexa appeared providentially, recognized me, and offered to act as an intermediary, I had to give him only the gist of what I had to say. I couldn't hope to explain all the details to him, and I couldn't hope that any of those details would get to you undistorted after passing through at least two Lithian intermediaries. All I could do was yell at the top of my voice for you two to get down here on the proper date—and hope that you heard me."

"This is a time of trouble, which is like a sickness in the house," Chtexa said. "I must not remain. I will wish to be left alone when I am troubled, and I cannot ask that, if I now force my presence on others who are troubled. I will bring my gift at a better time."

HE DUCKED OUT through the door, without any formal gesture of farewell, but nevertheless leaving behind an overwhelming impression of graciousness. Ruiz-

Sanchez watched him go helplessly, and a little forlornly. The Lithians always seemed to understand the essences of situations; they were never, like even the most cocksure of Earthmen, beset by the least apparent doubt.

And why should they be? They were backed—if Ruiz-Sanchez was right—by the second-best Authority in the universe, and backed directly, without intermediaries or conflicting interpretations. The very fact that they were never tormented by indecision identified them as creatures of that Authority. Only the children of God had been given free choice, and hence were often doubtful.

Nevertheless, Ruiz-Sanchez would have delayed Chtexa's departure had he been able. In a short-term argument it is helpful to have pure reason on your side—even though such an ally could be depended upon to stab you to the heart if you depended upon him too long.

"Let's go inside and thrash this thing out," Michelis said, shutting the door and turning back toward the front room. "It's a good thing we got some sleep, but we have so little time left now that it's going to be touch and go to have a formal decision ready when the ship comes."

"We can't go ahead yet," Agronski objected, although, along with Ruiz-Sanchez, he followed Michelis obediently enough. "How can we do anything sensible without having heard what Cleaver has to say? Every man's voice counts on a job of this sort."

"That's very true," Michelis said.

"And I don't like the present situation any better than you do—I've already said that. But I don't see that we have any choice. What do you think, Ramon?"

"I'd like to hold out for waiting," Ruiz-Sanchez said frankly. "Anything I may say now is, to put it realistically, somewhat compromised with you two. And don't tell me that you have every confidence in my integrity, because we had every confidence in Cleaver's, too. Right now, trying to maintain both confidences just cancels out both."

"You have a nasty way, Ramon, of saying aloud what everybody else is thinking," Michelis said, grinning bleakly. "What alternatives do you see, then?"

"None," Ruiz-Sanchez admitted. "Time is against us, as you said. We'll just have to go ahead without Cleaver."

"No, you won't." The voice, from the doorway to the sleeping chamber, was at once both uncertain and much harshened by weakness.

The others sprang up. Cleaver, clad only in his shorts, stood in the doorway, clinging to both sides of it. On one forearm Ruiz-Sanchez could see the marks where the adhesive tape which had held the IV tubing had been ripped off.

VI

PPAUL, you must be crazy," Michelis said, almost angrily. "Get back into your hammock before you make things twice as bad for yourself. You're a sick man, can't you realize that?"

"Not as sick as I look," Cleaver said, with a ghastly grin. "Actually I feel pretty fair. My mouth is almost all cleared up and I don't think I've got any fever. And I'll be damned if this Commission is going to proceed an inch without me. It isn't empowered to do it, and I'll appeal any decision—any decision, I hope you guys are listening—that it makes without me."

The other two turned helplessly to Ruiz-Sanchez.

"How about it, Ramon?" Michelis said, frowning. "Is it safe for him to be up like this?"

Ruiz-Sanchez was already at the physich's side, peering into his mouth. The ulcers were indeed almost gone, with granulation tissue forming nicely over the few that still remained. Cleaver's eyes were still slightly suffused, indicating that the toxemia was not completely defeated, but except for these two signs the effect of the accidental squill inoculation was no longer visible. It was true that Cleaver looked awful, but that was inevitable in a man recently quite sick, and in one who had been burning his own body proteins for fuel to boot.

"If he wants to kill himself, I guess he's got a right to do so, at least by indirection," Ruiz-Sanchez said. "Paul, the first thing you'll have to do is get off your feet, and get into a robe, and get a blanket around your legs. Then you'll have to eat something; I'll fix it for you. You've staged a wonderful recovery, but you're a sitting duck for a real infection if you abuse yourself during convalescence."

"I'll compromise," Cleaver said

immediately. "I don't want to be a hero, I just want to be heard. Give me a hand over to that hassock. I still don't walk very straight."

It took the better part of half an hour to get Cleaver settled to Ruiz-Sanchez' satisfaction. The physicist seemed in a wry way to be enjoying every minute of it. At last he had a mug of *gahitzi*, the local equivalent of tea, in his hand, and Michelis said:

"All right, Paul, you've gone out of your way to put yourself on the spot. Evidently that's where you want to be. So let's have the answer: Why didn't you communicate with us?"

"I didn't want to."

"Now wait a minute," Agronski said. "Paul, don't break your neck to say the first damn thing that comes into your head. Your judgment may not be well yet, even if your talking apparatus is. Wasn't your silence just a matter of your being unable to work the local message system—the Tree or whatever it is?"

"No, it wasn't," Cleaver insisted. "Thanks, Agronski, but I don't need to be shepherded down the safe and easy road, or have any alibis set up for me. I know exactly what I did that was ticklish, and I know that it's going to be impossible to set up consistent alibis for it now. My chances for keeping anything under my hat depended on my staying in complete control of everything I did. Naturally those chances went out the window when I got stuck by that damned pineapple. I realized that last night, when I fought like a demon to get through to you before the Father

could get back, and found that I couldn't make it."

"You seem to take it calmly enough now," Michelis observed.

"Well, I'm feeling a little washed out. But I'm a realist. And I also know, Mike, that I had damned good reasons for what I did. I'm counting on the chance that you'll agree with me wholeheartedly when I tell you why I did it."

"All right," Michelis said, "begin."

CLEAVER sat back, folding his hands quietly in the lap of his robe. He was obviously still enjoying the situation. He said:

"First of all, I didn't call you because I didn't want to, as I said. I could have mastered the problem of the Tree easily enough by doing what the Father did—that is, by getting a Snake to ferry my messages. Of course I don't speak Snake, but the Father does, so all I had to do was to take him into my confidence. Barring that, I could have mastered the Tree itself. I already know all the technical principles involved. Mike, you should see that Tree, it's the biggest single junction transistor anywhere in this galaxy, and I'll bet that it's the biggest one anywhere.

"But I wanted a gap to spring up between our party and yours. I wanted both of you to be completely in the dark about what was going on, down here on this continent. I wanted you to imagine the worst, and blame it on the Snakes, too, if that could be managed. After you got here—if you did—I



was going to be able to show you that I hadn't sent any messages because the Snakes wouldn't let me. I've got more plants to that effect squirrelled away around here than I'll bother to list now; there'd be no point in it, since it's all come to nothing. But I'm sure it would have looked conclusive, regardless of anything the Father would have been able to offer to the contrary.

"It was just a damned shame, from my point of view, that I had to run up against a pineapple at the last minute. It gave the Father a chance to find out something about what was up. I'll swear that if that hadn't happened, he wouldn't have smelt anything until you actually got here—and then it would have been too late."

"I probably wouldn't have, that's true," Ruiz-Sanchez said, watching Cleaver steadily. "But your running up against that 'pineapple' was no accident. If you'd been observing Lithia as you were sent here to do, instead of spending all your time building up a fictitious Lithia

for purposes of your own, you'd have known enough about the planet to have been more careful about 'pineapples.' You'd also have spoken at least as much Lithian as Agronski by this time."

"That," Cleaver said, "is probably true, and again it doesn't make any difference to me. I observed the one fact about Lithia that overrides all other facts, and that is going to turn out to be sufficient. Unlike you, Father, I have no respect for petty niceties in extreme situations, and I'm not the kind of man who thinks anyone learns anything from analysis after the fact."

"Let's not get to bickering," Michelin said. "You've told us your story without any visible decoration, and it's evident that you have a reason for confessing. You expect us to excuse you, or at least not to blame you too heavily, when you tell us what that reason is. Let's hear it."

"It's this," Cleaver said, and for the first time he seemed to become

a little more animated. He leaned forward, the glowing gaslight bringing the bones of his face into sharp contrast with the sagging hollows of his cheeks, and pointed a not-quite-steady finger at Michellis.

"Do you know, Mike, what it is that we're sitting on here? Do you know, just to begin with, how much rutile there is here?"

"Of course I know. If we decide to vote for opening the planet up, our titanium problem will be solved for a century, maybe even longer. I'm saying as much in my personal report. But we figured that that would be true even before we first landed here, as soon as we got accurate figures on the mass of the planet."

"And what about the pegmatite?" Cleaver demanded softly.

"What about it?" Michellis said, looking puzzled. "I suppose it's abundant; I really didn't bother to look. Titanium's important to us, but I don't quite see why lithium should be; the days when the metal was used as a rocket fuel are fifty years behind us."

"And yet the stuff's still worth about \$20,000 an English tonne back home, Mike, and that's exactly the same price it was drawing in the 1960's, allowing for currency changes since then. Doesn't that mean anything to you?"

"I'm more interested in what it means to you," Michellis said. "None of us can make a nickel out of this trip, even if we find the planet solid platinum inside—which is hardly likely. And if price is the only consideration, surely the fact that lithium is common here will break the market for it?

What's it good for, after all, on a large scale?"

"It's good for bombs," Cleaver said. "Fusion bombs. And, of course, controlled fusion power, if we ever lick that problem."

RUIZ-SANCHEZ suddenly felt sick and tired all over again. It was exactly what he had feared had been on Cleaver's mind, and he had not wanted to find himself right.

"Cleaver," he said, "I've changed my mind. I would have caught you out, even if you had never blundered against your 'pineapple.' That same day you mentioned to me that you were looking for pegmatite when you had your accident, and that you thought Lithia might be a good place for tritium production on a large scale. Evidently you thought that I wouldn't know what you were talking about. If you hadn't hit the 'pineapple,' you would have given yourself away to me before now by talk like that; your estimate of me was based on as little observation as is your estimate of Lithia."

"It's easy," Cleaver observed indulgently, "to say 'I knew it all the time.'"

"Of course it's easy, when the other man is helping you," Ruiz-Sanchez said. "But I think that your view of Lithia as a cornucopia of potential hydrogen bombs is only the beginning of what you have in mind. I don't believe that it's even your real objective. What you would like most is to see Lithia removed from the universe as far as you're concerned. You hate the

place, it's injured you, you'd like to think that it really doesn't exist. Hence the emphasis on Lithia as a source of tritium, to the exclusion of every other fact about the planet; for if that emphasis wins out, Lithia will be placed under security seal. Isn't that right?"

"Of course it's right, except for the phony mind-reading," Cleaver said contemptuously. "When even a priest can see it, it's got to be obvious. Mike, this is the most tremendous opportunity that man's ever had. This planet is made to order to be converted, root and branch, into a thermonuclear laboratory and production center. It has indefinitely large supplies of the most important raw materials. What's even more important, it has no nuclear knowledge of its own for us to worry about. All the clue materials, the radioactive elements and so on which you need to work out real knowledge of the atom, we'll have to import; the Snakes don't know a thing about them. Furthermore, the instruments involved, the counters and particle-accelerators and so on, all depend on materials like iron that the Snakes don't have, and on principles they don't know, like magnetism to begin with, and quantum theory. We'll be able to stock our plant here with an immense reservoir of cheap labor which doesn't know and—if we take proper precautions—never will have a prayer of learning enough to snitch classified techniques.

"All we need to do is to turn in a triple-E Unfavorable on the planet to shut off for a whole century any use of Lithia as a way sta-

tion or any other kind of general base. At the same time, we can report separately to the UN Review Committee exactly what we do have in Lithia: a triple-A arsenal for the whole of Earth, for the whole commonwealth of planets we control!"

"Against whom?" Ruiz-Sanchez said.

"What do you mean?"

"Against whom are you stocking this arsenal? Why do we need a whole planet devoted to making tritium bombs?"

"The UN itself can use weapons," Cleaver said drily. "The time isn't very far gone since there were still a few restive nations on Earth, and it could come around again. Don't forget also that thermonuclear weapons only last a few years—they can't be stockpiled indefinitely, like fission bombs. The half-life of tritium is very short. I suppose you wouldn't know anything about that. But take my word for it, the UN's police would be glad to know that they could have access to a virtually inexhaustible stock of tritium bombs, and to hell with the shelf-life problem!

"Besides, if you've thought about it at all, you know as well as I do that this endless consolidation of peaceful planets can't go on forever. Sooner or later—well, what happens if the next planet we touch on is a place like Earth? If it is, its inhabitants may fight, and fight like a planetful of madmen, to stay out of our frame of influence. Or what happens if the next planet we hit is an outpost for a whole federation, maybe bigger than ours? When that day comes—

and it will, it's in the cards—we'll be damned glad if we're able to plaster the enemy from pole to pole with fusion bombs, and clean up the matter with as little loss of life as possible."

"On our side," Ruiz-Sanchez added.

"Is there any other side?"

"By golly, it makes sense to me," Agronski said. "Mike, what do you think?"

"I'm not sure yet," Michelis said. "Paul, I still don't understand why you thought it necessary to go through all the cloak-and-dagger maneuvers. You tell your story fairly enough now, and it has its merits, but you also admit you were going to trick the three of us into going along with you, if you could. Why? Couldn't you trust the force of your argument alone?"

"No," Cleaver said bluntly. "I've never been on a Commission like this before, where there was no single, definite chairman, where there was deliberately an even number of members so that a split opinion couldn't be settled if it occurred—and where the voice of a man whose head is full of peck-wiffian, irrelevant moral distinctions and two-thousand-year-old metaphysics carries exactly the same weight as the voice of a scientist."

"That's mighty loaded language," Michelis said.

"I know it. If it comes to that, I'll say here or anywhere that I think the Father is a hell of a fine biologist, and that that makes him a scientist like the rest of us—insofar as biology's a science.

"But I remember once visiting the labs at Notre Dame, where they have a complete little world of germ-free animals and plants and have pulled I don't know how many physiological miracles out of the hat. I wondered then how one goes about being as good a scientist as that, and a Churchman at the same time. I wondered in which compartment is their brains they filed their religion, and in which their science. I'm still wondering.

"I didn't propose to take chances on the compartments getting interconnected on Lithia. I had every intention of cutting the Father down to a point where his voice would be nearly ignored by the rest of you. That's why I undertook the cloak-and-dagger stuff. Maybe it was stupid of me—I suppose that it takes training to be a successful agent-provocateur and that I should have realized it. But I'm not sorry I tried. *I'm only sorry I failed.*"

VII

THERE WAS a short, painful silence.

"Is that it, then?" Michelis said.

"That's it, Mike. Oh—one more thing. My vote, if anybody is in doubt about it, is to keep the planet closed. Take it from there."

"Ramon," Michelis said, "do you want to speak next? You're certainly entitled to it—the air's a mite murky at the moment."

"No, Mike; let's hear from you."

"I'm not ready to speak yet either, unless the majority wants

me to. Agronski, how about you?"

"Sure," Agronski said. "Speaking as a geologist, and also as an ordinary slob that doesn't follow rarified reasoning very well, I'm on Cleaver's side. I don't see anything either for or against the planet on any other grounds but Cleaver's. It's a fair planet as planets go, very quiet, not very rich in anything else we need, not subject to any kind of trouble that I've been able to detect. It'd make a good way station, but so would lots of other worlds hereabouts. It'd also make a good arsenal, the way Cleaver defined the term. In every other category it's as dull as ditch-water, and it's got plenty of that. The only other thing it can have to offer is titanium, which isn't quite as scarce back home these days as Mike seems to think, and gem-stones, particularly the semi-precious ones, which we can make at home without traveling 40 light-years. I'd say, either set up a way station here and forget about the planet otherwise, or else handle the place as Cleaver suggested."

"But which?" Ruiz-Sanchez asked.

"Well, which is more important, Father? Aren't way stations a dime a dozen? Planets that can be used as thermonuclear labs, on the other hand, are rare—Lithia is the first one that can be used that way, at least in my experience. Why use a planet for a routine purpose if it can be used for a unique purpose? Why not apply Occam's Razor—the law of parsimony? It works in all other scientific problems. It's my bet that it's the best tool to use on this one."

"You vote to close the planet, then," Michelis said.

"Sure. That's what I was saying, wasn't it?"

"I wanted to be certain," Michelis said. "Ramon, I guess it's up to us. Shall I speak first?"

"Of course, Mike."

"Then," Michelis said evenly, and without changing in the slightest his accustomed tone of grave impartiality, "I'll say that I think both of these gentlemen are fools, and calamitous fools at that because they're supposed to be scientists. Paul, your maneuvers to set up a phony situation are perfectly beneath contempt, and I shan't mention them again. I shan't even bother to record them, so you needn't feel that you have to mend any fences as far as I'm concerned. I'm looking solely at the purpose those maneuvers were supposed to serve, just as you asked me to do."

Cleaver's obvious self-satisfaction began to dim a little around the edges. He said, "Go ahead," and wound the blanket a little bit tighter around his legs.

LITHIA is not even the beginning of an arsenal," Michelis said. "Every piece of evidence you offered to prove that it might be is either a half-truth or the purest trash. Cheap labor, for instance: with what will you pay the Lithians? They have no money, and they can't be rewarded with goods. They have everything they need, and they like the way they're living right now—God knows they're not even slightly jealous of the achievements we think make Earth great."

He looked around the gently rounded room, shining softly in the gaslight. "I don't seem to see anywhere in here where a vacuum-cleaner would find much use. How will you pay the Lithians to work in your thermonuclear plants?"

"With knowledge," Cleaver said gruffly. "There's a lot they'd like to know."

"But what knowledge? The things they'd like to know are specifically the things you can't tell them if they're to be valuable to you as a labor force. Are you going to teach them quantum theory? You can't; that would be dangerous. Are you going to teach them electrodynamics? Again, that would enable them to learn other things you think dangerous. Are you going to teach them how to get titanium from ore, or how to accumulate enough iron to enable them to leave their present Stone Age? Of course you aren't. As a matter of fact, we haven't a thing to offer them in that sense. They just won't work for us under those terms."

"Offer them other terms," Cleaver said shortly. "If necessary, tell them what they're going to do, like it or lump it. It'd be easy enough to introduce a money system on this planet: you give a Snake a piece of paper that says it's worth a dollar, and if he asks you just what makes it worth a dollar—well, the answer is, We say it is."

"And we put a machine-pistol to his belly to emphasize the point," Ruiz-Sanchez interjected.

"Do we make machine-pistols for

nothing? I never figured out what else they were good for. Either you point them at someone or you throw them away."

"Item: slavery," Michells said. "That disposes, I think, of the argument for cheap labor. I won't vote for slavery. Ramon won't. Agronski?"

"No," Agronski said uneasily. "But it's a minor point."

"The hell it is. It's the reason why we're here. We're supposed to think of the welfare of the Lithians as well as of ourselves—otherwise this Commission procedure would be a waste of time, of thought, of money. If we want cheap labor, we can enslave any planet."

Agronski was silent.

"Speak up," Michells said stonily. "Is that true, or isn't it?"

Agronski said, "I guess it is."

"Cleaver?"

"Slavery's a swearword," Cleaver said sullenly. "You're deliberately clouding the issue."

"Say that again."

"Oh, hell. All right, Mike, I know you wouldn't. But you're wrong."

"I'll admit that the instant that you can demonstrate it to me," Michells said. He got up abruptly from his hassock, walked over to the sloping windowill, and sat down again, looking out into the rain-stippled darkness. He seemed to be more deeply troubled than Ruiz-Sanchez had ever before thought possible for him.

IN THE meantime," he resumed, "I'll go on with my own demonstration. Now what's to

be said about this theory of automatic security that you've propounded, Paul? You think that the Lithians can't learn the techniques they would need to be able to understand secret information and pass it on, and so they won't have to be screened. There again, you're wrong, as you'd have known if you'd bothered to study the Lithians even perfunctorily. The Lithians are highly intelligent, and they already have many of the clues they need. I've given them a hand toward pinning down magnetism, and they absorbed the material like magic and put it to work with enormous ingenuity."

"So did I," Ruiz-Sanchez said. "And I've suggested to them a technique for accumulating iron that should prove to be pretty powerful. I had only to suggest it, and they were already halfway down to the bottom of it and traveling fast. They can make the most of the smallest of clues."

"If I were the UN I'd regard both actions as the plainest kind of treason," Cleaver said harshly. "Since that may be exactly the way Earth will regard them, I think it'd be just as well if you told the folks at home that the Snakes found out both items by themselves."

"I don't plan to do any falsifying of the report," Michelis said, "but thanks anyhow—I appreciate the intent behind what you say, if not the ethics. I'm not through, however. So far as the actual, practical objective that you want to achieve is concerned, Paul, I think it's just as useless as it is impossible. The fact that you have here a

planet that's especially rich in lithium doesn't mean that you're sitting on a bonanza, no matter what price per tonne the metal is commanding back home. The fact of the matter is that you can't ship lithium home.

"Its density is so low that you couldn't send away more than a tonne of it per shipload; by the time you got it to Earth the shipping charges on it would more than outweigh the price you'd get for it on arrival. As you ought to know, there's lots of lithium on Earth's own moon, too, and it isn't economical to fly it back to Earth even over that short distance. No more would it be economical to ship from Earth to Lithia all the heavy equipment that would be needed to make use of lithium here. By the time you got your cyclotron and the rest of your needs to Lithia, you'd have cost the UN so much money that no amount of locally available pegmatite could compensate for it."

"Just extracting the metal would cost a fair sum," Agronski said, frowning slightly. "Lithium would burn like gasoline in this atmosphere."

Michelis looked from Agronski to Cleaver and back again. "Of course it would," he said. "The whole plan's just a chimera. It seems to me, also, that we have a lot to learn from the Lithians, as well as they from us. Their social system works like the most perfect of our physical mechanisms, and it does so without any apparent repression of the individual. It's a thoroughly liberal society, that nevertheless never even begins to tip

over toward the other side, toward the kind of Ghandism that keeps a people tied to the momma-and-poppa-farm and the roving-brigand economy. It's in balance, and not precarious balance, either, but perfect chemical equilibrium.

"The notion of using Lithia as a tritium bomb plant is easily the strangest anachronism I've ever encountered—it's as crude as proposing to equip a spaceship with canvas sails. Right here on Lithia is the real secret, the secret that's going to make bombs of all kinds, and all the rest of the anti-social armamentarium, as useless, unnecessary, obsolete as the Iron Boot!

"And on top of all that—no, please, I'm not quite finished, Paul—on top of all that, the Lithians are centuries ahead of us in some purely technical matters, just as we're ahead of them in others. You should see what they can do with ceramics, with semi-conductors, with static electricity, with mixed disciplines like histochemistry, immunochemistry, biophysics, teratology, electrogenetics, limnology, and half a hundred more. If you'd been looking, you *would* have seen.

"We have much more to do, it seems to me, than just vote to open the planet. That's a passive move. We have to realize that being able to use Lithia is only the beginning. The fact of the matter is that we actively *need* Lithia. We should say so in our recommendation."

HE UNFOLDED himself from the windowsill and stood up, looking down on them all, but most

especially at Ruiz-Sanchez. The priest smiled at him, but as much wth anguish as in admiration, and then had to look back at his shoes.

"Well, Agronski?" Cleaver said, spitting the words out like bullets on which he had been clenching his teeth during an amputation without anesthetics. "What do you say now? Do you like the pretty picture?"

"Sure, I like it," Agronski said, slowly but forthrightly. It was a virtue in him, as well as it was often a source of exasperation, that he always said exactly what he was thinking, the moment he was asked to do so. "Mike makes sense; I wouldn't expect him not to, if you see what I mean. Also he's got another advantage: he told us what he thought *without* trying first to trick us into his way of thinking."

"Oh, don't be a thumphead," Cleaver exclaimed. "Are we scientists or Boy Rangers? Any rational man up against a majority of dogooders would have taken the same precautions that I did."

"Maybe," Agronski said. "I don't know. They still smell to me like a confession of weakness somewhere in the argument. I don't like to be finessed. And I don't much like to be called a thumphead, either. But before you call me any more names, I'm going to say that I think you're more right than Mike is. I don't like your methods, but your aim seems sensible to me. Mike's shot some of your major arguments full of holes, that I'll admit; but as far as I'm concerned, you're still leading—by a nose."

He paused, breathing heavily and glaring at the physicist. Then he said:

"But *don't push*, Paul. I don't like being pushed."

Michelis remained standing for a moment longer. Then he shrugged, walked back to his hassock, and sat down, locking his hands between his knees.

"I did my best, Ramon," he said. "But so far it looks like a draw. See what you can do."

Ruiz-Sanchez took a deep breath. What he was about to do would without any doubt hurt him for the rest of his life, regardless of the goodness of his reasons, or the way time had of turning any knife. The decision had already cost him many hours of concentrated, agonized doubt. But he believed that it had to be done.

"I disagree with all of you," he said. "I believe that Lithia should be reported triple-E Unfavorable, as Cleaver does. But I think it should also be given a special classification: X-1."

"X-1—but that's a quarantine label," Michelis said. "As a matter of fact—"

"Yes, Mike. I vote to seal Lithia off from *all* contact with the human race. Not only now, or for the next century, but forever."

VIII

THE WORDS did not produce the consternation that he had been dreading—or, perhaps, had been hoping for, somewhere in the back of his mind. Evidently they were all too tired for that. They took his announcement with a kind of stunned emptiness, as though it were so far out of the expected or-

der of events as to be quite meaningless. It was hard to say whether Cleaver or Michelis had been hit the harder. All that could be seen for certain was that Agronski recovered first, and was now ostentatiously cleaning his ears, as if he were ready to listen again when Ruiz-Sanchez changed his mind.

"Well," Cleaver began. And then again, shaking his head amazedly, like an old man, "Well . . ."

"Tell us why, Ramon," Michelis said, clenching and unclenching his fists. His voice was quite flat, but Ruiz-Sanchez thought he could feel the pain under it.

"Of course. But I warn you, I'm going to be very roundabout. What I have to say seems to me to be of the utmost importance, and I don't want to see it rejected out of hand as just the product of my peculiar training and prejudices—interesting perhaps as a study in aberration, but not germane to the problem. The evidence for my view of Lithia is overwhelming. It overwhelmed me quite against my natural hopes and inclinations. I want you to hear that evidence."

"He wants us also to understand," Cleaver said, recovering a little of his natural impatience, "that his reasons are religious and won't hold water if he states them right out."

"Hush," Michelis said. "Listen."

"Thank you, Mike. All right, here we go. This planet is what I think is called in English a 'set-up.' Let me describe it for you briefly as I see it, or rather as I've come to see it.

"Lithia is a paradise. It resembles most closely the Earth in its pre-

Adamic period just before the coming of the great glaciers. The resemblance ends just there, because on Lithia the glaciers never came, and life continued to be spent in the paradise, as it was not allowed to do on Earth. We find a completely mixed forest, with plants which fall from one end of the creative spectrum to the other living side by side in perfect amity. To a great extent that's also true of the animals. The lion doesn't lie down with the lamb here because Lithia has neither animal, but as an analogy the phrase is apt. Parasitism occurs far less often on Lithia than it does on Earth, and there are very few carnivores of any sort. Almost all the surviving land animals eat plants only, and by a neat arrangement which is typically Lithian, the plants are admirably set up to attack animals rather than each other.

"It's an unusual ecology, and one of the strangest things about it is its rationality, its extreme, almost single-minded insistence on one-for-one relationships. In one respect it looks almost as though someone had arranged the whole planet to demonstrate the theory of sets.

"In this paradise we have a dominant creature, the Lithian, the man of Lithia. This creature is rational. It conforms as if naturally and without constraint or guidance to the highest ethical code we have evolved on Earth. It needs no laws to enforce this code; somehow, everyone obeys it as a matter of course, although it has never even been written down. There are no criminals, no deviants, no aberrations of any kind. The people are

not standardized—our own very bad and partial answer to the ethical dilemma—but instead are highly individual. Yet somehow no anti-social act of any kind is ever committed.

"Mike, let me stop here and ask: What does this suggest to you?"

"Why, just what I've said before that it suggested," Michelis said. "An enormously superior social science, evidently founded in a precise psychological science."

"Very well, I'll go on. I felt as you did at first. Then I came to ask myself: How does it happen that the Lithians not only have no deviants—think of that, no deviants—but it just happens, by the uttermost of all coincidences, that the code by which they live so perfectly is point for point the code we strive to obey. Consider, please, the imponderables involved in such a coincidence. Even on Earth we never have found a society which evolved independently *exactly* the same precepts as the Christian precepts. Oh, there were some duplications, enough to encourage the Twentieth Century's partiality toward synthetic religions like Theosophism and Hollywood Vedanta, but no ethical system on Earth that grew up independently of Christianity agreed with it point for point.

"And yet here, 40 light-years from Earth, what do we find? A Christian people, lacking nothing but the specific proper names and the symbolic appurtenances of Christianity. I don't know how you three react to this, but I found it extraordinary and indeed completely impossible—mathematically impossible—under any assumption

but one. I'll get to that assumption in a moment."

"You can't get there too soon for me," Cleaver said morosely. "How a man can stand 40 light-years from home in deep space and talk such parochial nonsense is beyond my comprehension."

"Parochial?" Ruiz-Sanchez said, more angrily than he had intended. "Do you mean that what we think true on Earth is automatically made suspect just by the fact of its removal into deep space? I beg to remind you, Cleaver, that quantum mechanics seems to hold good on Lithia, and that you see nothing parochial about behaving as if it did. If I believe in Peru that God created the universe, I see nothing parochial about believing it on Lithia."

"A while back I thought I had been provided an escape hatch, incidentally. Chetexa told me that the Lithians would like to modify the growth of their population, and he implied that they would welcome some form of birth control. But, as it turned out, birth control in the sense that my Church interdicts it is impossible to Lithia, and what Chetexa had in mind was obviously some form of conception control, a proposition to which my Church has already given its qualified assent. So there I was, even on this small point forced again to realize that we had found on Lithia the most colossal rebuke to our aspirations that we had ever encountered: A people that seemed to live with ease the kind of life which we associate with saints alone."

"Bear in mind that a Muslim

who visited Lithia would find no such thing. Neither would a Taoist. Neither would a Zoroastrian, presuming that there were still such, or a classical Greek. But for the four of us—and I include you, Cleaver, for despite your tricks and your agnosticism you still subscribe to the Christian ethical doctrines enough to be put on the defensive when you flout them—what we have here on Lithia is a coincidence which beggars description. It is more than an astronomical coincidence—that tired old phrase for numbers that don't seem very large any more—it is a transfinite coincidence. It would take Cantor himself to do justice to the odds against it."

"Wait a minute," Agronski said. "Holy smoke. Mike, I don't know any anthropology, I'm lost here. I was with the Father up to the part about the mixed forest, but I don't have any standards to judge the rest. Is it so, what he says?"

"Yes, I think it's so," Michells said slowly. "But there could be differences of opinion as to what it means, if anything. Ramon, go on."

I'VE SCARCELY begun. I'm still describing the planet, and more particularly the Lithians. The Lithians take a lot of explaining; what I've said about them thus far states only the most obvious fact. I could go on to point out many more equally obvious facts: that they have no nations and no national rivalries (and if you'll look at the map of Lithia you'll see every reason why they should have developed such rivalries), that they have emotions and passions but are

never moved by them to irrational acts, that they have only one language, that they exist in complete harmony with everything, large and small, that they find in their world. In short, they're a people that couldn't exist, and yet does.

"Mike, I'd go beyond your view to say that the Lithians are the most perfect example of how human beings ought to behave that we're ever likely to find, for the very simple reason that they behave now the way human beings once did before a series of things happened of which we have record. I'd go even farther beyond it, far enough to say that as an example the Lithians are useless to us, because until the coming of the Kingdom of God no substantial number of human beings will ever be able to imitate Lithian conduct. Human beings seem to have built-in imperfections that the Lithians lack, so that after thousands of years of trying we are farther away than ever from our original emblems of conduct, while the Lithians have never departed from theirs.

"And don't allow yourselves to forget for an instant that these emblems of conduct are the same on both planets. That couldn't ever have happened, either. But it did.

"I'm now going to describe another interesting fact about Lithian civilization. It is a fact, whatever you may think of its merits as evidence. It is this: that your Lithian is a creature of logic. Unlike Earthmen of all stripes, he has no gods, no myths, no legends. He has no belief in the supernatural, or, as we're calling it in our barbarous jargon these days, the 'paranormal.' He

has no traditions. He has no tabus. He has no faiths, blind or otherwise. He is as rational as a machine. Indeed, the only way in which we can distinguish the Lithian from an organic computer is his possession and use of a moral code.

"And that, I beg you to observe, is completely irrational. It is based upon a set of axioms, of propositions which were 'given' from the beginning—though your Lithian will not allow that there was ever any Giver. The Lithian, for instance Chtexa, believes in the sanctity of the individual. Why? Not by reason, surely, for there is no way to reason to that proposition. It is an axiom. Chtexa believes in juridical defense, in the equality of all before the code. Why? It's possible to behave reasonably from the proposition but not to reason one's way to it.

"If you assume that the responsibility to the code varies with age, or with the nature of one's work, or with what family you happen to belong to, logical behavior can follow from one of those assumptions, but there again one can't arrive at the principle by reason alone. One begins with belief: 'I think that all people ought to be equal before the law.' That is a statement of faith, nothing more. Yet Lithian civilization is so set up as to suggest that one can arrive at such basic axioms of Christianity, and of Western civilization on Earth as a whole, by reason alone, in the plain face of the fact that one cannot."

"Those are axioms," Cleaver growled. "You don't arrive at them by faith, either. You don't arrive at them at all. They're self-evident."

"Like the axiom that only one parallel can be drawn to a given line? Go on, Cleaver, you're a physicist; kick a stone for me and tell me it's self-evident that the thing is solid."

"It's peculiar," Michelis said in a low voice, "that Lithian culture should be so axiom-ridden without the Lithians being aware of it. I hadn't formulated it in quite this way before, Ramon, but I've been disturbed myself at the bottomless assumptions that lie behind Lithian reasoning. Look at what they've done in solid-state physics, for instance. It's a structure of the purest kind of reason, and yet when you get down to its fundamental assumptions you discover the axiom that matter is real. How can they know that? How did logic lead them to it? If I say that the atom is just a hole-inside-a-hole-through-a-hole, where can reason intervene?"

"But it works," Cleaver said.

"So does our solid-state physics—but we work on opposite axioms," Michelis said. "That's not the issue. I don't myself see how this immense structure of reason which the Lithians have evolved can stand for an instant. It doesn't seem to rest on anything."

"I'm going to tell you," Ruiz-Sanchez said. "You won't believe me, but I'm going to tell you anyhow, because I have to. *It stands because it's being propped up.* That's the simple answer and the whole answer. But first I want to add one more fact about the Lithians."

"They have complete physical recapitulation outside the body."

"What does that mean?" Agronski said.

"Do you know how a human child grows inside its mother's body? It is a one-celled animal to begin with, and then a simple metazoan resembling the freshwater hydra or the simplest jellyfish. Then, very rapidly, it goes through many other animal forms, including the fish, the amphibian, the reptile, the lower mammal, and finally becomes enough like a man to be born. This process biologists call recapitulation.

"They assume that the embryo is passing through the various stages of evolution which brought life from the single-celled organism to man, on a contracted time scale. There is a point, for instance, in the development of the fetus when it has gills. It has a tail almost to the very end of its time in the womb, and sometimes still has it when it is born. Its circulatory system at one point is reptilian, and if it fails to pass successfully through that stage, it is born as a 'blue baby' with patent ductus arteriosus, the tetralogy of Fallot, or a similar heart defect. And so on."

"I see," Agronski said. "I've encountered the idea before, of course, but I didn't recognize the term."

"Well, the Lithians, too," go through this series of metamorphoses as they grow up, but they go through it outside the bodies of their mothers. This whole planet is one huge womb. The Lithian female lays her eggs in her abdominal pouch, and then goes to the sea to give birth to her children. What she bears is not a reptile, but

a fish. The fish lives in the sea a while, and then develops rudimentary lungs and comes ashore. Stranded by the tides on the flats, the lungfish develops rudimentary legs and squirms in the mud, becoming an amphibian and learning to endure the rigors of living away from the sea. Gradually their limbs become stronger, and better set on their bodies, and they become the big froglike things we sometimes see leaping in the moonlight, trying to get away from the crocodiles.

"Many of them do get away. They carry their habit of leaping with them into the jungle, and there they change once again to become the small, kangaroo-like reptiles we've all seen, at one time or another, fleeing from us among the trees. Eventually, they emerge, fully grown, from the jungles and take their places among the folk of the cities as young Lithians, ready for education. But they have already learned every trick of every environment that their world has to offer except those of their own civilization."

MICHELIS locked his hands together again and looked up at Ruiz-Sanchez. "But that's a discovery beyond price!" he said with quiet excitement. "Ramon, that alone is worth our trip to Lithia. I can't imagine why it would lead you to ask that the planet be closed! Surely your Church can't object to it in any way—after all, your theorists did accept recapitulation in the human embryo, and also the geological record that showed the same process in action over longer spans

of time."

"Not," Ruiz-Sanchez said, "in the way that you think we did. The Church accepted the facts, as it always accepts facts. But—as you yourself suggested not ten minutes ago—facts have a way of pointing in several different directions at once. The Church is as hostile to the doctrine of evolution—particularly in respect to man—as it ever was, and with good reason."

"Or with obdurate stupidity," Cleaver said.

"All right, Paul, look at it very simply with the original premises of the Bible in mind. If we assume just for the sake of argument that God created man, did He create him perfect? I should suppose that He did. Is a man perfect without a navel? I don't know, but I'd be inclined to say that he isn't. Yet the first man—Adam, again for the sake of argument—wasn't born of woman, and so didn't really *need* to have a navel. Nevertheless he would have been imperfect without it, and I'll bet that he had one."

"What does that prove?"

"That the geological record, and recapitulation too, do not prove the doctrine of evolution. Given my initial axiom, which is that God created everything from scratch, it's perfectly logical that He should have given Adam a navel, Earth a geological record, and the embryo the process of recapitulation. None of these indicate a real past; all are there because the creations involved would have been imperfect otherwise."

"Wow," Cleaver said. "And I used to think that Milne relativity was abstruse."

"Oh, any coherent system of thought becomes abstruse if it's examined long enough. I don't see why my belief in a God you can't accept is any more rarefied than Mike's vision of the atom as a hole-inside-a-hole-through-a-hole. I expect that in the long run, when we get right down to the fundamental particles of the universe, we'll find that there's nothing there at all—just no-things moving no-place through no-time. On the day that that happens, I'll have God and you will not—otherwise there'll be no difference between us.

"But in the meantime, what we have here on Lithia is very clear indeed. We have—and now I'm prepared to be blunt—a planet and a people propped up by the Ultimate Enemy. It is a gigantic trap prepared for all of us. We can do nothing with it but reject it, nothing but say to it, *Retro me, Sathanas*. If we compromise with it in any way, we are damned."

"Why, Father?" Michelis said quietly.

"Look at the premises, Mike. One: Reason is always a sufficient guide. Two: The self-evident is always the real. Three: Good works are an end in themselves. Four: Faith is irrelevant to right action. Five: Right action can exist without love. Six: Peace need not pass understanding. Seven: Ethics can exist without evil alternatives. Eight: Morals can exist without conscience. Nine—but do I really need to go on? We have heard all these propositions before, and we know Who proposes them.

"And we have seen these demon-

strations, for instance, in the rocks which was supposed to show how the horse evolved from Eohippus, but which somehow never managed to convince the whole of mankind. Then the discovery of intra-uterine recapitulation, which was to have clinched the case for the so-called descent of man—and yet, somehow, failed again to produce general agreement. These were both very subtle arguments, but the Church is not easily swayed; it is founded on a rock.

"Now we have, on Lithia, a new demonstration, both the subtlest and at the same time the crudest of all. It will sway many people who could have been swayed in no other way, and who lack the intelligence or the background to understand that it is a rigged demonstration. It seems to show us evolution in action on an inarguable scale. It is supposed to settle the question once and for all, to rule God out of the picture, to snap the chains that have held Peter's rock together all these many centuries. Henceforth there is to be no more question; there is to be no more God, but only phenomenology—and, of course, behind the scenes, within the hole that's inside the hole that's through a hole, the Great Nothing itself, the thing that has never learned any word but *No*: It has many other names, but we know the name that counts. That's left us.

"Paul, Mike, Agronski, I have nothing more to say than this: We are all of us standing on the brink of Hell. By the grace of God, we may still turn back. We must turn

back—for I at least think that this is our last chance."

IX

THE VOTE was cast, and that was that. The Commission was tied, and the question would be thrown open again in higher echelons on Earth, which would mean tying Lithia up for years to come. The planet was now, in effect, on the Index.

The ship arrived the next day. The crew was not much surprised to find that the two opposing factions of the Commission were hardly speaking to each other. It often happened that way.

The four Commission members cleaned up the house the Lithians had given them in almost complete silence. Ruiz-Sanchez packed the blue book with the gold stamping without being able to look at it except out of the corner of his eye, but even obliquely he could not help seeing its title:

FINNEGANS WAKE

James Joyce

He felt as though he himself had been collated, bound and stamped, a tortured human text for future generations of Jesuits to explicate and argue.

He had rendered the verdict he had found it necessary for him to render. But he knew that it was not a final verdict, even for himself, and certainly not for the UN, let alone the Church. Instead, the verdict itself would be the knotty question for members of his Order

yet unborn:

Did Father Ruiz-Sanchez correctly interpret the Divine case, and did his ruling, if so, follow from it?

"Let's go, Father. It'll be take-off time in a few minutes."

"All ready, Mike."

It was only a short journey to the clearing, where the mighty spindle of the ship stood ready to weave its way back through the geodesics of deep space to the sun that shone on Peru. The baggage went on board smoothly and without fuss. So did the specimens, the films, the special reports, the recordings, the sample cases, the vivariums, the aquariums, the type-cultures, the pressed plants, the tubes of soil, the chunks of ore, the Lithian manuscripts in their atmosphere of neon; everything was lifted decorously by the cranes and swung inside.

Agronski went up the cleats to the airlock first, with Michelia following him. Cleaver was stowing some last-minute bit of gear, something that seemed to require delicate, almost reverent care before the cranes could be allowed to take it in their indifferent grip. Ruiz-Sanchez took advantage of the slight delay to look around once more at the near margins of the forest.

At once, he saw Chitexa. The Lithian was standing at the entrance to the path the Earthmen themselves had taken away from the city to reach the ship. He was carrying something.

Cleaver swore under his breath and undid something he had just

(Continued on page 116)



*Alexander Pope wrote, "Atoms or systems into ruin hurled,
And now a bubble burst, and now a world." He died in
1872—but poets are sometimes the best prophets!*

The Trouble with

BUBBLES

By Philip K. Dick

Illustrated by Joseph R. Eberle

NATHAN HULL left his surface car and crossed the pavement on foot, sniffing the chill morning air. Robot work-trucks were starting to rumble past. A gutter slot sucked night debris greedily. A vanishing headline caught his eye momentarily:

**PACIFIC TUBE COMPLETED;
ASIAN LAND MASS LINKED**

He passed on away from the corner, hands in his pockets, looking for Farley's house.

Past the usual Worldcraft Store with its conspicuous motto: "Own Your Own World!" Down a short grass-lined walk and onto a sloping tilt-front porch. Up three imitation marble stairs. Then Hull flicked his hand before the code beam and the door melted away.

The house was still. Hull found the ascent tube to the second floor and peered up. No sound. Warm air blew around him, tinged with faint smells—smells of food and people and familiar objects. Had they gone? No. It was only the third day; they'd be around someplace, maybe up on the roof terrace.

He ascended to the second floor and found it also vacant. But distant sounds drifted to his ears. A tinkle of laughter, a man's voice. A woman's—perhaps Julia's. He hoped so—hoped she were still conscious.

He tried a door at random, steeling himself. Sometimes during the third and fourth days the Contest Parties got a little rough. The door melted, but the room was empty. Couches, empty glasses, ashtrays, exhausted stimulant tubes, articles

of clothing strewn everywhere—

Abruptly Julia Marlow and Max Farley appeared, arm in arm, followed by several others, pushing forward in a group, excited and red-checked, eyes bright, almost feverish. They entered the room and halted.

"Nat!" Julia broke away from Farley and came breathlessly up to him. "Is it that late already?"

"Third day," Hull said. "Hello, Max."

"Hello, Hull. Sit down and make yourself comfortable. Can I get you something?"

"Nothing. Can't stay. Julia—"

Farley waved a rohanb over, sweeping two drinks from its chest tray. "Here, Hull. You can stay long enough for one drink."

Bart Longstreet and a slender blonde appeared through a door. "Hull! You here? So soon?"

"Third day. I'm picking Julia up. If she still wants to leave."

"Don't take her away," the slim blonde protested. She wore a *side-glance* robe, invisible out of the corner of the eye, but an opaque fountain when looked at directly. "They're judging right now. In the lounge. Stick around. The fun's just beginning." She winked at him with heavy blue-lidded eyes, glazed and sleep-drugged.

Hull turned to Julia. "If you want to stay . . ."

Julia put her hand nervously on his arm, standing close to him. Not losing her fixed smile she grated in his ear: "Nat, for God's sake, get me out of here. I can't stand it. Please!"

Hull caught her intense appeal, her eyes bright with desperation.

He could feel the mute urgency quivering through her body, tense and strained. "Okay, Julia. We'll take off. Maybe get some breakfast. When did you last eat?"

"Two days. I think. I don't know." Her voice trembled. "They're judging right now. God, Nat. You should have seen—"

"Can't go until the judging's over," Farley rumbled. "I think they're almost through. You didn't enter, Hull? No entry for you?"

"No entry."

"Surely you're an owner—"

"Nope. Sorry." Hull's voice was faintly ironic. "No world of my own, Max. Can't see it."

"You're missing something." Max beamed dopily, rocking back on his heels. "Quite a time—best Contest Party for weeks. And the real fun begins *after* the judging. All this is just preliminary."

"I know." Hull moved Julia rapidly toward the descent tube.

"We'll see you. So long, Bart. Give me a call when you're out of here."

"Hold it!" Bart murmured suddenly, cocking his head. "The judging's over. The winner is going to be announced." He pushed toward the lounge, the others excitedly behind. "You coming, Hull? Julia?"

Hull glanced at the girl. "All right." They followed reluctantly. "For a minute, maybe."

A WALL of sound struck them. The lounge was a seething chaos of milling men and women.

"I won!" Lora Becker shouted in ecstasy. People pushed and shoved around her, toward the Contest table, grabbing up their

entries. Their voices grew in volume, an ominous rumble of discordant sound. Robants calmly moved furniture and fixtures back out of the way, clearing the floor rapidly. An unleashed frenzy of mounting hysteria was beginning to fill the big room.

"I knew it!" Julia's fingers tightened around Hull's arm. "Come on. Let's get out before they start."

"Start?"

"Listen to them!" Julia's eyes flickered with fear. "Come on, Nat! I've had enough. I can't stand any more of this."

"I told you before you came."

"You did, didn't you?" Julia smiled briefly, grabbing her coat from a robant. She fastened the coat rapidly around her breasts and shoulders. "I admit it. You told me. Now let's go, for God's sake." She turned, making her way through the surging mass of people toward the descent tube. "Let's get out of here. We'll have breakfast. You were right. These things aren't for us."

Lora Becker, plump and middle-aged, was making her way up onto the stand beside the judges, her entry clasped in her arms. Hull paused a moment, watching the immense woman struggle up, her chemically corrected features gray and sagging in the unwinking overhead lights. The third day—a lot of old-timers were beginning to show the effects, even through their artificial masks.

Lora reached the stand. "Look!" she shouted, holding up her entry. The Worldcraft bubble glittered, catching the light. In spite of him-

self Hull had to admire the thing. If the actual world inside was as good as the exterior . . .

Lora turned on the bubble. It glowed, winking into brilliance. The roomful of people became silent, gazing up at the winning entry, the world that had taken the prize over all other comers.

Lora Becker's entry was masterful. Even Hull had to admit it. She increased the magnification, bringing the microscopic central planet into focus. A murmur of admiration swept the room.

Again Lora increased the magnification. The central planet grew, showing a pale green ocean lapping faintly at a low shoreline. A city came into view, towers and broad streets, fine ribbons of gold and steel. Above, twin suns beamed down, warming the city. Myriads of inhabitants swarmed about their activities.

"Wonderful," Bart Longstreet said softly, coming over beside Hull. "But the old hag has been at it sixty years. No wonder she won. She's entered every Contest I can remember."

"It's nice," Julia admitted in a clipped voice.

"You don't care for it?" Longstreet asked.

"I don't care for any of this!"

"She wants to go," Hull explained, moving toward the descent tube. "We'll see you later, Bart."

Bart Longstreet nodded. "I know what you mean. In many ways I agree. You mind if I—"

"Watch!" Lora Becker shouted, her face flushed. She increased the magnification to maximum focus, showing details of the minute city.

"See them? See?"

The inhabitants of the city came into sharp view. They hurried about their business, endless thousands of them. In cars and on foot. Across spidery spans between buildings, breathtakingly beautiful.

Lora held the Worldcraft bubble up high, breathing rapidly. She gazed around the room, her eyes bright and inflamed, glittering unhealthily. The murmurings rose, sweeping up in excitement. Numerous Worldcraft bubbles came up, chest-high, gripped in eager, impassioned hands.

Lora's mouth opened. Saliva dribbled down the creases of her sagging face. Her lips twitched. She raised her bubble up over her head, her doughy chest swelling convulsively. Suddenly her face jerked, features twisting wildly. Her thick body swayed grotesquely—and from her hands the Worldcraft bubble flew, crashing to the stand in front of her.

The bubble smashed, bursting into a thousand pieces. Metal and glass, plastic parts, gears, struts, tubes, the vital machinery of the bubble, splattered in all directions.

Pandemonium broke loose. All around the room other owners were smashing their worlds, breaking them and crushing them, stamping on them, grinding the delicate control mechanisms underfoot. Men and women in a frenzy of abandon, released by Lora Becker's signal, quivering in an orgy of Dionysian lust. Crushing and breaking their carefully constructed worlds, one after another.

"God," Julia gasped, struggling to get away, Longstreet and Hull

beside her.

Faces gleamed with sweat, eyes feverish and bright. Mouths gaped foolishly, muttering meaningless sounds. Clothes were torn, ripped off. A girl went down, sliding underfoot, her shrieks lost in the general din. Another followed, dragged down into the milling mass. Men and women struggled in a blur of abandon, cries and gasps. And on all sides the hideous sounds of smashing metal and glass, the unending noise of worlds being destroyed one after another.

Julia dragged Hull from the lounge, her face white. She shuddered, closing her eyes. "I knew it was coming. Three days, building up to this. Smashed—they're smashing them all. All the worlds."

Bart Longstreet made his way out after Hull and Julia. "Lunatics." He lit a cigarette shakily. "What the hell gets into them? This has happened before. They start breaking, smashing their worlds up. It doesn't make sense."

Hull reached the descent tube. "Come along with us, Bart. We'll have breakfast—and I'll give you my theory, for what it's worth."

"Just a second." Bart Longstreet scooped up his Worldcraft bubble from the arms of a robot. "My Contest entry. Don't want to lose it."

He hurried after Julia and Hull.

"**M**ORE coffee?" Hull asked, looking around.

"None for me," Julia murmured. She settled back in her chair, sighing. "I'm perfectly happy."

"I'll take some." Bart pushed his

cup toward the coffee dispenser. It filled the cup and returned it. "You've got a nice little place here, Hull."

"Haven't you seen it before?"

"I don't get up this way. I haven't been in Canada in years."

"Let's hear your theory," Julia murmured.

"Go ahead," Bart said. "We're waiting."

Hull was silent for a moment. He gazed moodily across the table, past the dishes, at the thing sitting on the window ledge. Bart's Contest entry, his Worldcraft bubble.

"Own Your Own World," Hull quoted ironically. "Quite a slogan."

"Packman thought it up himself," Bart said. "When he was young. Almost a century ago."

"That long?"

"Packman takes treatments. A man in his position can afford them."

"Of course." Hull got slowly to his feet. He crossed the room and returned with the bubble. "Mind?" he asked Bart.

"Go ahead."

Hull adjusted the controls mounted on the bubble's surface. The interior scene flickered into focus. A miniature planet, revolving slowly. A tiny blue-white sun. He increased the magnification, bringing the planet up in size.

"Not bad," Hull admitted presently.

"Primitive. Late Jurassic. I don't have the knack. I can't seem to get them into the mammal stage. This is my sixteenth try. I never can get any farther than this."

The scene was a dense jungle,

steaming with fetid rot. Great shapes stirred fitfully among the decaying ferns and marshes. Coiled, gleaming, reptilian bodies, smoking shapes rising up from the thick mud—

"Turn it off," Julia murmured. "I've seen enough of them. We viewed hundreds for the Contest."

"I didn't have a chance," Bart retrieved his bubble, snapping it off. "You have to do better than the Jurassic, to win. Competition is keen. Half the people there had their bubbles into the Eocene—and at least ten into the Pliocene. Lora's entry wasn't much ahead. I counted several city-building civilizations. But hers was almost as advanced as we are."

"Sixty years," Julia said.

"She's been trying a long time. She's worked hard. One of those to whom it's not a game but a real passion. A way of life."

"And then she smashes it," Hull said thoughtfully. "Smashes the bubble to bits. A world she's been working on for years. Guiding it through period after period. Higher and higher. Smashes it into a million pieces."

"Why?" Julia asked. "Why, Nat? Why do they do it? They get so far, building it up—and then they tear it all down again."

Hull leaned back in his chair. "It began," he stated, "when we failed to find life on any of the other planets. When our exploring parties came back empty-handed. Eight dead orbs—lifeless. Good for nothing. Not even lichen. Rock and sand. Endless deserts. One after the other, all the way out to Pluto."

"It was a hard realization," Bart

said. "Of course, that was before our time."

"Not much before. Packman remembers it. A century ago. We waited a long time for rocket travel, flight to other planets. And then to find nothing . . ."

"Like Columbus finding the world really was flat," Julia said. "With an edge and a void."

"Worse. Columbus was looking for a short rouse to China. They could have continued the long way. But when we explored the system and found nothing we were in for trouble. People had counted on new worlds, new lands in the sky. Colonization. Contact with a variety of races. Trade. Minerals and cultural products to exchange. But most of all the thrill of landing on planets with amazing life-forms."

"And instead of that . . ."

"Nothing but dead rock and waste. Nothing that could support life—our own or any other kind. A vast disappointment set in on all levels of society."

"And then Packman brought out the Worldcraft bubble," Bart murmured. "'Own Your Own World'. There was no place to go, outside of Terra. No other worlds to visit. You couldn't leave here and go to another world. So instead, you—"

"Instead you stayed home and put together your own world." Hull smiled wryly. "You know, he has a child's version out, now. A sort of preparation kit. So the child can cover the basic problems of world building before he even has a bubble."

"But look, Nat," Bart said. "The bubbles seemed like a good idea, at first. We couldn't leave Terra so we

built our own worlds right here. Sub-atomic worlds, in controlled containers. We start life going on a sub-atomic world, feed it problems to make it evolve, try to raise it higher and higher. In theory there's nothing wrong with the idea. It's certainly a creative pastime. Not a merely passive viewing like television. In fact, world-building is the ultimate art form. It takes the place of all entertainments, all the passive sports as well as music and painting—"

"But something went wrong."

"Not at first," Bart objected. "At first it was creative. Everybody bought a Worldcraft bubble and built his own world. Evolved life farther and farther. Molded life. Controlled it. Competed with others to see who could achieve the most advanced world."

"And it solved another problem," Julia added. "The problem of leisure. With robots to work for us and robots to serve us and take care of our needs—"

"Yes, that was a problem," Hull admitted. "Too much leisure. Nothing to do. That, and the disappointment of finding our planet the only habitable planet in the system."

"Packman's bubbles seemed to solve both problems. But something went wrong. A change came. I noticed it right away." Hull stubbed out his cigarette and lit another. "The change began ten years ago—and it's been growing worse."

"BUT WHY?" Julia demanded. "Explain to me why everyone stopped building their

worlds creatively and began to destroy."

"Ever seen a child pull wings off a fly?"

"Certainly. But—"

"The same thing. Sadism? No, not exactly. More a sort of curiosity. Power. Why does a child break things? Power, again. We must never forget something. These world bubbles are *substitutes*. They take the place of something else, of finding genuine life on our own planets. And they're just too damn small to do that.

"These worlds are like toy boats in a bath tub. Or model rocketships you see kids playing with. They're surrogates, not the actual thing. These people who operate them—why do they want them? Because they can't explore real planets, big planets. They have a lot of energy dammed up inside them. Energy they can't express.

"And bottled-up energy sours. It becomes aggressive. People work with their little worlds for a time, building them up. But finally they reach a point where their latent hostility, their sense of being deprived, their—"

"It can be explained more easily," Bart said calmly. "Your theory is too elaborate."

"How do you explain it?"

"Man's innate destructive tendencies. His natural desire to kill and spread ruin."

"There's no such thing," Hull said flatly. "Man isn't an ant. He has no fixed direction to his drives. He has no instinctive 'desire to destroy' any more than he has an instinctive desire to carve ivory letter-openers. He has *energy*—and the

outlet it takes depends on the opportunities available.

"That's what's wrong. All of us have energy, the desire to move, act, do. But we're bottled up here, sealed off, on one planet. So we buy Worldcraft bubbles and make little worlds of our own. But microscopic worlds aren't enough. They're as satisfactory as a toy sailboat is to a man who wants to go sailing."

Bart considered a long time, deep in thought. "You may be right," he admitted finally. "It sounds reasonable. But what's your suggestion? If the other eight planets are dead—"

"Keep exploring. Beyond the system."

"We're doing that."

"Try to find outlets that aren't so artificial."

Bart grinned. "You feel this way because you never caught the hang of it." He thumped his bubble fondly. "I don't find it artificial."

"But most people do," Julia put in. "Most people aren't satisfied. That's why we left the Contest Party."

Bart grunted. "It's turning sour, all right. Quite a scene, wasn't it?" He reflected, frowning. "But the bubbles are better than nothing. What do you suggest? Give up our bubbles? What should we do instead? Just sit around and talk?"

"Nat loves to talk," Julia murmured.

"Like all intellectuals." Bart tapped Hull's sleeve. "When you sit in your seat in the Directorate you're with the Intellectual and Professional class—gray stripe."

"And you?"

"Blue stripe. Industrial. You know that."

Hull nodded. "That's right. You're with Terran Spaceways. The ever-hopeful company."

"So you want us to give up our bubbles and just sit around. Quite a solution to the problem."

"You're going to have to give them up." Hull's face flushed. "What you do after that is your affair."

"What do you mean?"

Hull turned toward Longstreet, eyes blazing. "I've introduced a bill in the Directorate. A bill that will outlaw Worldcraft."

Bart's mouth fell open. "You what?"

"On what grounds?" Julia asked, waking up.

"On moral grounds," Hull stated calmly. "And I think I can get it through."

THE DIRECTORATE hall buzzed with murmuring echoes, its vast reaches alive with moving shadows, men taking their places and preparing for the session's business.

Eldon von Stern, Directorate Floor Leader, stood with Hull off to one side behind the platform. "Let's get this straight," von Stern said nervously, running his fingers through his iron-gray hair. "You intend to *speak* for this bill of yours? You want to defend it yourself?"

Hull nodded. "That's right. Why not?"

"The analytical machines can break the bill down and present an impartial report for the members. Spellbinding has gone out of style. If you present an emotional ha-

rangue you can be certain of losing. The members won't—"

"I'll take the chance. It's too important to leave to the machines."

Hull gazed out over the immense room that was slowly quieting. Representatives from all over the world were in their places. White-clad property owners. Blue-clad financial and industrial magnates. The red shirts of leaders from factory cooperatives and communal farms. The green-clad men and women representing the middle-class consumer group. His own gray-striped body, at the extreme right, the doctors, lawyers, scientists, educators, intellectuals and professionals of all kinds.

"I'll take the chance," Hull repeated. "I want to see the bill passed. It's time the issues were made clear."

Von Stern shrugged. "Suit yourself." He eyed Hull curiously. "What do you have against Worldcraft? It's too powerful a combine to buck. Packman himself is here, someplace. I'm surprised you—"

The robot chair flashed a signal. Von Stern moved away from Hull, up onto the platform.

"Are you sure you want to speak for the bill?" Julia said, standing beside Hull in the shadows. "Maybe he's right. Let the machines analyze the bill."

Hull was gazing out across the sea of faces, trying to locate Packman. The owner of Worldcraft was sitting out there. Forrest Packman, in his immaculate white shirt, like an ancient, withered angel. Packman preferred to sit with the property group, considering Worldcraft real estate instead of industry.

Property still had the edge on prestige.

Von Stern touched Hull's arm. "All right. Take the chair and explain your proposal."

Hull stepped out onto the platform and seated himself in the big marble chair. The endless rows of faces before him were carefully devoid of expression.

"You've read the terms of the proposal I'm speaking for," Hull began, his voice magnified by the speakers on each member's desk. "I propose we should declare Worldcraft Industries a public menace and the real property the possession of the State. I can state my grounds in a few sentences.

"The theory and construction of, the Worldcraft product, the sub-atomic universe system, is known to you. An infinite number of sub-atomic worlds exist, microscopic counterparts of our own spatial coördinate. Worldcraft developed, almost a century ago, a method of controlling to thirty decimals the forces and stresses involved on these micro-coördinate planes, and a fairly simplified machine which could be manipulated by any adult person.

"These machines for controlling specific areas of sub-atomic coördinates have been manufactured and sold to the general public with the slogan: 'Own Your Own World'. The idea is that the owner of the machine becomes literally a world owner, since the machine controls forces that govern a sub-atomic universe that is directly analogous to our own.

"By purchasing one of these Worldcraft machines, or bubbles,

the person finds himself in possession of a virtual universe, to do with as he sees fit. Instruction manuals supplied by the Company show him how to control these minute worlds so that life forms appear and rapidly evolve, giving rise to higher and higher forms until at last—assuming the owner is sufficiently skilful—he has in his personal possession a civilization of beings on a cultural par with our own.

"During the last few years we have seen the sale of these machines grow until now almost everyone possesses one or more sub-atomic worlds, complete with civilizations. And these years have also seen many of us take our private universes and grind the inhabitants and planets into dust.

"There is no law which prevents us from building up elaborate civilizations, evolved at an incredible rate of speed, and then crushing them out of existence. That is why my proposal has been presented. These minute civilizations are not dreams. They are real. They actually exist. The microscopic inhabitants are—"

A restless stir moved through the vast hall. There were murmurs and coughs. Some members had switched off their speakers. Hull hesitated. A chill touched him. The faces below were blank, cold, uninterested. He continued rapidly.

"The inhabitants are, at present, subject to the slightest whim their owner may feel. If we wish to reach down and crush their world, turn on tidal waves, earthquakes, tornados, fire, volcanic action—if we wish to destroy them utterly, there

is nothing they can do.

"Our position in relation to these minute civilizations is godlike. We can, with a wave of the hand, obliterate countless millions. We can send the lightning down, level their cities, squash their tiny buildings like ant hills. We can toss them about like toys, playthings, victims of our every whim."

Hull stopped, rigid with apprehension. Some of the members had risen and strolled out. Von Stern's face twisted with ironic amusement.

Hull continued lamely. "I want to see Worldcraft bubbles outlawed. We owe it to these civilizations on humanitarian grounds, on moral grounds—"

He went on, finishing as best he could. When he got to his feet there was a faint ripple of applause from the gray-striped professional group. But the white-clad property owners were utterly silent. And the blue industrialists. The red shirts and the green-clad consumer representatives were silent, impassive, even a little amused.

Hull returned to the wings, cold with the stark realization of defeat. "We've lost," he muttered, dazed. "I don't understand."

Julia took his arm. "Maybe an appeal on some other grounds . . . Maybe the machines can still—"

Bart Longstreet came out of the shadows. "No good, Nat. Won't work."

Hull nodded. "I know."

"You can't moralize Worldcraft away. That's not the solution."

Von Stern had given the signal. The members began to cast their votes, the tabulation machines

whirring to life. Hull stood staring silently out at the murmuring room, crushed and bewildered.

Suddenly a shape appeared in front of him, cutting off his view. Impatiently he moved to one side—but a rasping voice stopped him.

"Too bad, Mr. Hull. Better luck next time."

Hull stiffened. "Packman!" he muttered. "What do you want?"

Forrest Packman came out of the shadows, moving toward him slowly, feeling his way blindly along.

BART LONGSTREET stared at the old man with unconcealed hostility. "I'll see you later, Nat." He turned abruptly and started off.

Julia stopped him. "Bart, do you have to—"

"Important business. I'll be back later." He moved off down the aisle, toward the industrial section of the hall.

Hull faced Packman. He had never seen the old man so close before. He studied him as he advanced slowly, feeling his way along on the arm of his robot.

Forrest Packman was old—a hundred and seven years. Preserved by hormones and blood transfusions, elaborate washing and rejuvenating processes that maintained life in his ancient, withered body. His eyes, deep-sunk, peered up at Hull as he came near, shrunken hands clutching the arm of his robot, breath coming hoarse and dry.

"Hull? You don't mind if I chat with you as the voting goes on? I won't be long." He peered blindly

past Hull. "Who left? I couldn't see—"

"Bart Longstreet. Spaceways."

"Oh, yes. I know him. Your speech was quite interesting, Hull. It reminded me of the old days. These people don't remember how it was. Times have changed." He stopped, letting the robant wipe his mouth and chin. "I used to be interested in rhetoric. Some of the old masters . . ."

The old man rambled on. Hull studied him curiously. Was this frail withered old man really the power behind Worldcraft? It didn't seem possible.

"Bryan," Packman whispered, voice dry as ashes. "William Jennings Bryan. I never heard him, of course. But they say he was the greatest. Your speech wasn't bad. But you don't understand. I listened carefully. You have some good ideas. But what you're trying to do is absurd. You don't know enough about people. Nobody's really interested in—"

He broke off, coughing feebly, his robant gripping him with metal supports.

Hull pushed impatiently past. "The voting is almost finished. I want to hear. If you have anything to say to me you can file a regular memo plate."

Packman's robant stepped out, barring his way. Packman went on slowly, shakily. "Nobody is really interested in such appeals, Hull. You made a good speech but you don't have the idea. Not yet, at least. But you talk well, better than I've heard for a long time. Those young fellow, faces all washed, running around like office boys—"

Hull strained, listening to the vote. The impassive robant body cut off his view, but over Packman's dry rasp he could hear the results. Von Stern had risen and was reading the totals, group by group.

"Four hundred against, thirty-five in favor," von Stern stated. "The proposal has been defeated." He tossed the tabulation cards down and picked up his agenda. "We'll continue with the next business."

Behind Hull, Packman broke off suddenly, his skull-like head cocked on one side. His deep-sunk eyes glittered and the trace of a smile twitched across his lips. "Defeated? Not even all the grays voted for you, Hull. Now maybe you'll listen to what I have to say."

Hull turned away from the hall. The robant lowered its arm. "It's over," Hull said.

"Come on," Julia moved uneasily away from Packman. "Let's get out of here."

"You see," Packman continued relentlessly, "you have potentials that could be developed into something. When I was your age I had the same idea you have. I thought if people could see the moral issues involved, they would respond. But people aren't like that. You have to be realistic, if you want to get somewhere. People . . ."

Hull scarcely heard the dry, raspy voice whispering away. Defeat. Worldcraft, the world bubbles, would continue. The Contest Parties: bored, restless men and women with too much time, drinking and dancing, comparing worlds, building up to the climax—then the orgy of breaking and smashing.

Over and over. Endlessly.

"Nobody can buck Worldcraft," Julia said. "It's too big. We'll have to accept the bubbles as a part of our lives. As Bart says, unless we have something else to offer in their place . . ."

Bart Longstreet came rapidly out of the shadows. "You still here?" he said to Packman.

"I lost," Hull said. "The vote—"

"I know. I heard it. But it doesn't matter." Longstreet pushed past Packman and his robot. "Stay here. I'll join you in a second. I have to see von Stern."

Something in Longstreet's voice made Hull look up sharply. "What is it? What's happened?"

"Why doesn't it matter?" Julia demanded.

Longstreet stepped up on the platform and made his way to von Stern. He handed him a message plate and then retired to the shadows.

Von Stern glanced at the plate—

And stopped talking. He got to his feet slowly, the plate gripped tightly. "I have an announcement to make." Von Stern's voice was shaking, almost inaudible. "A dispatch from Spaceways' check station on Proxima Centauri."

An excited murmur rushed through the hall.

"Exploring ships in the Proxima system have contacted trading scouts from an extra-galactic civilization. An exchange of messages has already occurred. Spaceways ships are moving toward the Aroturan system with the expectation of finding—"

Shouts, a bedlam of sound. Men and women on their feet, scream-

ing in wild joy. Von Stern stopped reading and stood, his arms folded, his gray face calm, waiting for them to quiet.

Forrest Packman stood unmoving, his withered hands pressed together, his eyes shut. His robot sent support braces around him, catching him in a shield of protecting metal.

"Well?" Longstreet shouted, pushing back to them. He glanced at the frail, withered figure held up by the robot's supports, then at Hull and Julia. "What do you say, Hull? Let's get out of here—so we can celebrate."

"I'll fly you home," Hull said to Julia. He looked around for an inter-continental cruiser. "Too bad you live so far away. Hong Kong is so damn out of the way."

Julia caught his arm. "You can drive me yourself. Remember? The Pacific Tube is open. We're connected with Asia, now."

"That's right." Hull opened the door of his surface car and Julia slid in. Hull got behind the wheel and slammed the door. "I forgot, with all these other things on my mind. Maybe we can see each other more often. I wouldn't mind spending a few days vacation in Hong Kong. Maybe you'll invite me."

He sent the car out into traffic, moving with the remote-controlled beam. "Tell me more," Julia asked. "I want to know all Bart said."

"Not much more. They've known for some time that something was up. That's why he wasn't too worried about Worldcraft. He knew

the bottom would fall out as soon as the announcement was made."

"Why didn't he tell you?"

Hull grinned wryly. "How could he? Suppose the first reports were wrong? He wanted to wait until they were sure. He knew what the results would be." Hull gestured. "Look."

On both sides of the strip a tide of men and women poured out of buildings, up from the underground factories, a seething mass milling everywhere in disordered confusion, shouting and cheering, throwing things in the air, tossing paper out of windows, carrying each other on their shoulders.

"They're working it off," Hull said. "The way it should be. Bart says Arcturus is supposed to have seven or eight fertile planets, some of them inhabited, some just forests and oceans. The extra-galactic traders say that most systems have at least one usable planet. They visited our system a long time ago. Our early ancestors may have traded with them."

"Then there's plenty of life in the galaxy?"

Hull laughed. "If what they say is true. And the fact that *they* exist is proof enough."

"No more Worldcraft."

"No." Hull shook his head. No more Worldcraft. Stock was already being dumped. Worthless. Probably the State would absorb the bubbles already in existence and seal them off, leaving the inhabitants free to determine their own futures.

The neurotic smashing of laboriously achieved cultures was a thing of the past. The buildings of

living creatures would no longer be pushed over to amuse some god suffering from *ennui* and frustration.

Julia sighed, leaning against Hull. "Now we can take it easy. Sure; you're invited to stay. We can take out permanent cohabitation papers if you want to—"

Hull leaned forward suddenly, his body rigid. "Where's the Tube?" he demanded. "The strip should be hitting it any minute."

Julia peered ahead, frowning. "Something's wrong. Slow down."

Hull slowed the car. An obstruction signal was flashing ahead. Cars were stopping on all sides, shifting into emergency retard lanes.

He ground the car to a halt. Rocket cruisers were sweeping overhead, exhaust tubes shattering the evening silence. A dozen uniformed men ran across a field, directing a rumbling robot derrick.

"What the hell—" Hull muttered. A soldier stepped up to the car, swinging a communication flare.

"Turn around. We need the whole strip."

"But—"

"What happened?" Julia asked.

"The Tube. Earthquake, someplace half way out. Broke the Tube in ten sections." The soldier hurried off. Construction robots rushed past in a hand cart, assembling equipment as they went.

Julia and Hull stared at each other wide-eyed. "Good Lord," Hull muttered. "Ten places. And the Tube must have been full of cars."

(Continued on page 117)



The climate was perfect, the sky was always blue, and—best of all—nobody had to work. What more could anyone want?

Planet of Dreams

By James McKimmey, Jr.

Illustrated by Paul Orban

IT WAS a small world, a tiny spinning globe, placed in the universe to weather and age by itself until the end of things. But because its air was good and its earth was fertile, Daniel Loveral had placed a finger upon a map and said, "This is the planet. This is the Dream Planet."

That was two years before, back on Earth. And now Loveral with his selected flock had shot through space, to light like chuckling geese upon the planet, to feel the effect of their dreams come true.

Loveral was sitting in his office, drumming his long fingers against his desk while the name, Atkinson, ticked through his brain like the sound of a sewing machine.

Would he be the only one, Loveral asked himself, or was he just the first? In either case, it was up to Loveral, as leader and guiding hand, to stop this thing and stop it quickly.

Loveral stood up and put on his

jacket, although there was no need for it, other than the formality it gave his figure.

He stepped out of his office into a clear bright day, where the air was clean and fresh in his lungs, at once like frost and fire and sweet perfume. He walked along a winding path, which was bordered by slim-necked flowers and a short hedge whose even clipped lines were kept neat by tireless robot hands.

Trees pointed to a blue sky, rocking and fluttering their leaves in a soft breeze, and glinting metallic houses lay peacefully beyond in wooded hollows and upon slight hills.

A whole small world was before his eyes, set there upon his direction, maintained by himself with the help of a dozen complex machines which lay locked and scaled in the Maintenance Room for only his fingers to touch.

It was a busy life for Loveral, up

at dawn to work until deep night, keeping his flock happy and free from spirit-killing labor. But it was a perfect plan, one which had been tested and turned in his mind for years. If he had to work hard to keep it running smoothly, that was all right. In fact, he had never been happier.

Now, however, there was this business about Atkinson. Loveral was disturbed about that.

He walked on, over the quiet path which would lead to the house where Atkinson and his wife lived. Loveral smiled, in readiness for any happy face that might appear before him, to greet him, to show with thankful eyes appreciation for his wonderful world. But that, too, brought thoughts that were a bit disturbing.

Lately there had been few such faces. Most of his flock no longer seemed to care about walking along the cultivated paths, or smiling, or nodding, or touching a leaf here or a flower there. They preferred, it appeared, to remain deep inside their houses, as though they might have become tired of the soft perfection of Dream Planet. As though they might have become weary of quiet woods and sweet bird-music or a sky which was always blue.

Loveral shook his head as he walked, puzzling out his thoughts. It was strange, but nothing to worry about certainly.

Just this business about Atkinson. That was his only worry.

He came slowly up a hill, the top of which held a low curving house, with a silver roof and wide, sweeping windows. There were yellow

and blue and deep red flowers, skirting the sides of the house, and green ivy grew thickly between the glistening windows. The lawn, dotted with small leafy trees and round bushes, sloped down from the front of the house, looking like a carefully arranged painting.

Loveral pressed a button beside a shining door and waited, smiling through his pale blue kindly eyes.

MRS. ATKINSON appeared after several moments and stood blinking at him. She was a thin woman, who seemed to have gotten even thinner. Loveral noticed. She was working her fingers at the neck of her dress. She smiled but her lips wavered.

"My dear," Loveral greeted her in his soft voice, showing the goodness in his eyes.

She nodded her recognition, opening her mouth without speaking.

"May I?" said Loveral finally, waving his long fingers toward the living room.

"Oh, yes," said the woman. "Of course, Mr. Loveral." And as she spoke Loveral had the impression she might suddenly begin crying.

Loveral followed the woman into the house, noticing all over again the precise way everything had been arranged. The rug was soft beneath his feet, and the light came in through the windows in such a way that it, too, became soft. The furniture, molded to hold a human body most comfortably, rested about the room in perfect efficiency.

"Your place is so lovely," Lov-

eral said, out of his old habit from Earth. But his words seemed to ring strangely in the quiet, because it was his own arrangement, like all the other rooms on the planet. And Mrs. Atkinson, standing thin and nervous before him, had nothing, after all, to do with it. The cleanliness was the work of his robot machines, the planning his own. It was like complimenting himself.

He cleared his throat and stood, smiling his most benevolent smile to reassure Mrs. Atkinson.

"Ah, my dear. Is George about?"

Again, the woman's hand skittered to her throat.

"He's not ill, surely?" Loveral asked, although this, too, was silly, because foods, selected and prepared for utmost nutrition, packed and frozen to be doled out in weekly quantities, purified air, disease-killing x-rays, simply written fold-ers on exercise, and of course Loveral's own philosophies of quiet, peaceful living—all of this guarded well the health of Dream Planet's flock.

The woman shook her head. "No, George is fine. He's just—sleeping, I think."

"Rest is nature's finest tonic," said Loveral, and hearing his voice thought suddenly there was hardly anything he could say any more that might not sound a bit out of place in this peaceful world. Rest to the man who had nothing to do ceased to be a tonic.

"Yes, yes," said Loveral. "May we just sit down, my dear?"

Mrs. Atkinson jerked a hand toward one of the chairs and then wound her fingers.

Loveral sat down and leaned

back, smiling his most charming smile. "Perhaps George might awaken after a bit?"

"Oh, yes," the woman said, her eyes flickering, and she sat upon the edge of one chair, like a bird perched upon a thin wire.

Loveral waited, legs crossed, leaning his head back against the silken softness of the chair. It was so good to relax these days. The business of watching and of caring for his flock was trying. When you have brought an entire community of people at great expense through space, guaranteeing to give them a life of constant comfort and ease, so that they might dream and think as they wander through the flowers and the leaves, their thoughts cleansed of worry about work and responsibility, then you have a job. Loveral was most busy, busier than his heritage of wealth ever before had allowed, seeing to all of this.

But he also was most content—with everything except Atkinson.

Mrs. Atkinson teetered on the edge of her chair, as though she might at any moment go flying across the room in a crazy gyration. There was something about her eyes, Loveral noticed, while he peacefully nodded in the chair. Fear, perhaps.

If so, he probably had been right. He tightened himself, listening. There it was again. The sound. Just as he had heard it a day before when he had passed near the house. He leaned forward quickly.

Mrs. Atkinson jumped.

Loveral smiled. "Didn't I hear a noise of some sort, my dear?"

"Noise?" the woman said, as though her own voice were the

sound of an echo.

"An odd noise," Loveral said, his eyes searching.

The woman's hands fluttered about her dress.

Loveral stood up. "Would you mind if I just glanced about, my dear?"

The woman didn't answer, but Loveral was already moving across the room toward a door. He opened it and walked down a hall. The noise grew stronger. He threw open another door.

HE STOOD Watching while George Atkinson spun around, dark eyes flashing, hair tousled. There was a two days' growth of beard darkening Atkinson's face.

"Why, George," Loveral said, swiftly examining the litter of metal and wood which was spread over a table behind Atkinson. There was a home-made hammer in Atkinson's hand. "What have we here, George?"

"Something for you," Atkinson said, tightening his fingers about the handle of the hammer.

Loveral grinned his famous Loveral grin. "That's fine. What could it be?"

"None of your damned business."

"George," Loveral said, his smile still white but his eyes narrow and quick.

The woman was behind them. Her voice screeched. "George, I told you. Why didn't you listen, George? You should have listened to me. You—"

Loveral held up a hand, still watching Atkinson. "Now tell me,

George, what is it you're making for me?"

Atkinson raised the hammer slightly.

Loveral stood very still. "That's a nice hammer, George."

Atkinson's eyes were black beneath his thick brows.

"You made that, didn't you?" Loveral asked.

"Yes, I made that," Atkinson said. "I made that and I made something else. Another minute and I'll have that finished, too."

"George," said Loveral, stepping quietly forward, "I don't like to say this, of course. You've been one of our very best members. But nobody works here, George. We can't allow that. You know the rules."

"I know the rules, all right."

"Well, then," Loveral said, extending his hand toward the hammer, "we'll just destroy this and whatever else you might have been making. We'll just forget it ever happened. We'll get along real fine that way, George. We'll just be such good friends."

"We'll just go to hell," said Atkinson, snatching his hammer away.

Loveral's smile disappeared. "I'll tell you, George. I have to mean business with this. You know the reasons. If we allow anybody to work here, then there's going to be trouble. That isn't our plan. We're here to grow within ourselves and expand culturally. Not to commercialize a beautiful world like Dream Planet."

Atkinson stood unmoving, and Loveral could see the way the man's muscles were tight, like steel springs, and the way his eyes

burned deep inside their blackness.

"We've given you everything you need," Loveral explained, trying to adjust the smile on his lips again. "Everybody has everything they want. But, you see, if you sit there and work and make something that someone else doesn't have, then the whole system is destroyed. Then someone will want what you've made. We'll have jealousy and hatred and fighting. This is the stuff of which wars are made, George. You know that. It starts with small things like this, but it grows. When it does, the structure of our life here will collapse. You wouldn't want that, would you, George?"

"Yes!" Atkinson said, his mouth white at the edges. "I'd like to see the whole rotten thing collapsed and blown to hell!"

Loveral's teeth snapped together and his lips grew tight. He could feel a muscle jumping along his neck.

Atkinson looked at him with furious eyes. "What do you think it's like, living this way? You're busy working twenty-four hours a day, while we wander around this damned prison like the breathing dead. You can feel sweat and aches in your bones from a hard day's work. Sleep is like medicine to you, instead of another stretch of torture. You can forget your own brain for a while by doing something with your hands. You can relax because you can get tired. Not us, by God. Not us!"

"I envy you, George," Loveral said through his teeth.

"Oh, like hell you do. You treat us like we were helpless infants.

You feed and clothe us and do all our work, and you're so happy you damned near split your guts."

"I'll take that, if you don't mind," Loveral said, reaching for the hammer, his voice suddenly icy cold.

Atkinson slammed back against the table. "No you won't. You won't take anything more at all. You've taken our spirit and our pride and the strength right out of our spines. You won't take anything more!"

"George?" Loveral said, but not moving any further.

Atkinson slid the hammer back of him onto the table, and his hands were searching among a dozen scattered pieces of metal and wood. He watched Loveral as he worked. "Let me show you what else I've made," he said.

"I'd hate to do it," Loveral said, "but I can stop your food, your water, everything."

Atkinson's hands moved swiftly, assembling the pieces. He nodded. "You can, but you won't."

"I have the only keys to the storage units. I control everything, George."

"Correction," said Atkinson, holding an assembled revolver in his hands. "You *did*."

LOVERAL looked at what Atkinson had in his hands. He blinked.

"You're nearly dead," Atkinson said.

Loveral looked at Atkinson, into his eyes. "If you wanted to kill me, you could have done it some other way."

Atkinson shook his head. "Just

this way. Just with something that took me dozens of days and nights to make. With something that made me sweat and swear to get. It was difficult—with no tools or proper materials—but that made it all the better. Now I've got it finished," he said, pushing a bullet into the chamber, "and ready to use."

Loveral stood frozen, then he turned. "My dear," he said to the woman who moved her mouth as though her voice had been pumped out of her. He reached to touch her shoulder. She recoiled, as though his fingers held poison. "George," he said, turning back to the black-eyed man.

"This is a great moment," Atkinson said, lifting the muzzle of the revolver. "When I squeeze the trigger, it'll be like blowing the lock off a prison door. I'll go yelling to the others, and we'll smash down the whole goddamned place. We'll smash it down, so we'll have to rebuild it. We'll pull apart every robot you've got. We'll tear apart the food lockers and have a celebration for a week, and when we've gotten sick from too much food, we'll start growing some more with our own hands. We'll make forges for the men and looms for the women. We'll burn our clothes and make new ones. We'll grow corn in the fields. We'll pump water from the ground. You're finished, Loveral."

Loveral stared at the revolver. "George," he said, pleading. "The plans. The beautiful, beautiful plans. All of you, you all wanted peace and contentment. Time to think and dream. You all wanted to get away from the work and the worry and the responsibility. You—"

Atkinson fired the gun into Loveral's stomach.

Loveral gestured at the air and fell to his knees. Atkinson threw his gun through a window and grabbed his wife by the hand. "Hurry!" he said, laughing. "Hurry!"

Loveral felt of the blood on his shirt and rested on his knees. He could hear footsteps, racing through the house and out to the yard. He held out his bloody hand and looked at it. Atkinson's voice pealed through the warm clear air. "He's dead! Loveral's dead!"

There was a sound of sudden activity, and everywhere went the cry, "Loveral's dead!"

Loveral sank to his haunches and opened his lips. The blood was there, too. He could hear the shouts and the laughter, and then the tearing of steel, the smashing of glass. He bent over his knees, trembling with a sudden chill. The sound of destruction grew like thunder. "Why?" he said in his dying throat. "Ob, why? It was what they said they wanted?"

Personalities in Science

A Bell Rang 30 Feet Away, and Wireless Was Born

WHEN Guglielmo Marconi was born, a servant in his parents' home in Bologna exclaimed, "What big ears he has!" His mother answered, with an almost unbelievably prophetic pride, "With such ears he will be able to hear the still small voice of the air."

Marconi's father was a prosperous business man; his mother, Anna Jameson, was the daughter of a well-known Dublin distiller's family. She was a staunch Scotch-Irish Protestant and an exceedingly fine musician; she taught young Guglielmo to be an accomplished pianist, a student of the Bible, and to be both tenacious and persevering.

Marconi was absorbed in science by the time he was twelve. The only thing that seemed able to tear him away from his experiments was his fondness for an old blind man, and this one small leisure was explained when his parents discovered that the old man was a former telegrapher and was teaching young Guglielmo Morse code.

At twenty he read an obituary of the German Heinrich Hertz which described Hertz's experiments with electro-magnetic waves and became possessed with the idea that



Guglielmo Marconi

signals could be transmitted through the air without wires, just as Hertz had transmitted the spark. His first experiment with the idea succeeded that same year. After months of heartbreaking failure he pressed a switch one night—and a bell rang in a room 30 feet away. This first success was followed by others with distances constantly increasing. But when Marconi offered the Italian government the invention, it was decided after a brief discussion that the machine was not worthy of attention and his offer was refused.

His mother encouraged him to try her country, and in 1896 he arrived in London with two trunks full of instruments. The instru-

ments had suffered mightily at the hands of the customs inspectors, and Marconi's first heartbreaking task was to replace them. Fortunately, the British Government realized that he had a revolutionary invention which might one day make it possible to communicate with ships at sea. Less than one year later a corporation was formed to exploit wireless telegraphy, and the first sending station was built on the Isle of Wight. And this young inventor of twenty-three found himself an immensely wealthy man.

Despite occasional fiascos, the success of wireless received worldwide publicity; stations were built on the Continent and in England, and wireless equipment was installed in all British and Italian ships. But Marconi was not content; his dream was to unite Europe and America by wireless. He had been warned that the curvature of the Earth would interfere with the waves; people scolded him for not being content with what he had already wrought, and the cost of establishing the trans-oceanic stations was prohibitive in the face of possible failure—yet he was determined to try.

Faced with disaster at the very outset when the station at the Southwest tip of England was destroyed in a storm, Marconi stubbornly spent a year rebuilding it, and then proceeded to Newfoundland which had been chosen as the American point for the trans-Atlantic effort. Weather conditions and technical difficulties that were almost insurmountable battled against him, but in 1901 the first

signal—three clicks like the three dots of Morse code—came through to the English station and Guglielmo Marconi's dream was a reality.

THE TREMENDOUS news was received with large doses of scepticism, and to still forever the doubting voices Marconi decided to build a regular station for permanent transmission at the site of the experimental station in Newfoundland. But more than scepticism had to be overcome. The cable company that owned the trans-Atlantic cable threatened legal action if the wireless experiments didn't stop, and Marconi saw the dream fade.

Canada, spurred by the faith of Mother England in the experiments, offered 16,000 pounds and land in Nova Scotia for the American station. It took two long years of effort, disappointment and experiment to complete the station—and more heartbreak was in store for Marconi before success was achieved. Then the twenty-eight-year-old genius returned to Europe and a hero's triumph.

Honors and titles were showered on him, and these served to spur him on to newer heights. After two years of unceasing work he decided to take a vacation, and typically chose one of the remote wireless stations as the perfect spot. Here at Pool he met nineteen-year-old Beatrice O'Brien, and after a whirlwind courtship they were married. The honeymoon spot was, again characteristically, the station at Nova Scotia.

While still on the boneymoon Marconi was recalled to London. The company's funds had run out and London banks refused new credit to further research and experiment. A frantic trip to Italy to seek further financing was fruitless; the Italian banks didn't think he was a good risk either. Marconi's only hope seemed to lie in reorganizing the company himself. He was able to do it—but it took everything that he had. Instead of better times, things just got blacker. His first son was stricken and died at three months; German and American cable companies were infringing on his patents, and the Glace Bay station which had cost so much in time, money, and effort was completely destroyed by fire.

The indomitable spirit of perseverance and tenacity that was the mark of this man was scarcely dented by these disasters; instead they seemed to spur him on. He rolled up his sleeves and proceeded to fight the patent infringements with everything he could muster, began the rebuilding of the Glace Bay station, and did all in his power to convince the world that wireless had commercial possibilities.

In less than a year the station had been rebuilt, the first lawsuit won, and Marconi was riding the crest of the wave again. The honor of receiving the Nobel Prize for physics in 1909 merely interrupted the steamroller for a brief time. Having exploited all the possibilities of long radio waves, he started work with short waves and by 1927 had transmitted the human voice from England to Australia. Then came work with reflected radio waves which were to produce our present day radar, and experiments with ultra-short waves which were to be the key to television.

Those who lived and worked with him admired his simplicity, patience, and warmheartedness; and perhaps the greatest tribute was paid to this self-taught man who had never been to a university by the London Times in an editorial written at the time of his death.

"When the early twentieth century comes to be surveyed by historians yet unborn, Guglielmo Marconi may be regarded as the supremely significant character of the epoch, the name by which our age is called." —epw

A RARE TREAT is in store in the next issue of IF. William Tenn, who writes with unrivalled skill but much too rarely, returns with *The Custodian*. It's a tale of the last man on Earth—but don't decide now that the theme is familiar: this man was in that position by choice! The long, lead novelette will be by Mari Wolf. *Homo Inferior* tells of a man who was alone in a different way, for Eric was surrounded by his own people, but couldn't communicate with them! These and other fine stories in the November IF will thrill and surprise you. On sale everywhere September 11th.



They were out of place in the Manly Age—Stonecypher, a man who loved animals; Moe, a bull who hated men. Together, they marched to inevitably similar destinies . . .

Thy ROCKS *and* RILLS

By Robert Ernest Gilbert

Illustrated by Tom Beecham

PRELUDE

M. STONECYPHER lifted his feed sun hat with the square brim, and used a red handkerchief to absorb the perspiration streaking his forehead. He said, "The pup'll make a good guard, 'especially for thrill parties."

L. Dan's golden curls flickered in July 1 sunlight. The puppy growled when Dan extended a gloved hand. "I don't want a guard," the hobbyist said. "I want him for a dogfight."

A startling bellow rattled the windows of the dog house and spilled in deafening waves across the yard. Dan whirled, clutching his staff. Light glinted on his plastic cuirass and danced on his red nylon tights. His flabby face turned white. "What—" he panted.

Stonecypher concealed a smile behind a long corded hand and

said, "Just the bull. Serenades us sometimes."

Dan circled the dog house. Stonecypher followed with a forefinger pressed to thin lips. In the paddock, the bull's head moved up and down. It might or might not have been a nod.

The crest of long red and blue-black hairs on the bull's neck and shoulders created an illusion of purple, but the rest of the animal matched the black of a duelmaster's tam. Behind large eyes encircled by a white band, his skull bulged in a swelling dome, making the distance between his short horns seem much too great.

"He's purple!" Dan gasped. "Why in the Government don't you put him in the ring?"

Stonecypher gestured toward the choppy surface of Kings Lake, nine hundred feet below. He said, "Coincidence. I make out the ringmas-

ter's barge just leavin' Highland Pier."

"You're selling him?"

"Yeah. If they take 'im, I'd like to see 'im in the ring on Dependence Day."

Glancing at the watch embedded in the left pectoral of his half-armor, Dan said, "That would be a show! I'll take the dog and fly. I've a duel in Highland Park at 11:45."

"The pup's not for sale."

"Not for sale!" Dan yelled. "You told—"

"Thought you wanted a guard. I don't sell for dogfights."

A sound like "Goood!" came from the paddocked bull.

Dan opened his mouth wide. Whatever he intended to say died without vocalization, for Catriona came driving the mule team up through the apple orchard. The almost identical mules had sorrel noses, gray necks, buckskin flanks, and black and white pinto backs and haunches. "Great Government!" Dan swore. "This place is worse than a museum!"

"Appaloosa mules," Stonecypher said.

Catriona jumped from the seat of the mowing machine. Dan stared. Compared to the standard woman of the Manly Age who, by dieting, posturing, and exercise from childhood, transformed herself into a small, thin, dominated creature, Catriona constituted a separate species. She was taller than Dan, slightly plump, and her hair could have been classed as either red or blonde. Green overalls became her better than they did Stonecypher. With no trace of a smile on face or

in voice, Stonecypher said, "L. Dan, meet Catriona."

LIKE A hypnopath's victim, Dan walked to Catriona. He looked up at her and whispered, but too loudly. Stonecypher heard. His hands clamped on the hobbyist's neck and jerked. Dan smashed in the grass with sufficient force to loosen the snaps of his armor. He rolled to his feet and swung his staff.

Stonecypher's left hand snatched the staff. His right fist collided with Dan's square jaw. Glaring down at the hobbyist, Stonecypher gripped the staff and rotated thick wrists outward. The tough plastic popped when it broke.

Scuttling backward, Dan regained his feet. "You inhuman brute!" he growled. "I intended to pay for her!"

"My wife's not for sale either," Stonecypher said. "You know how to fly."

Dan thrust out a coated tongue and made a noise with it. In a memorized singsong, he declared, "I challenge you to a duel, in accordance with the laws of the Government, to be fought in the nearest duelpen at the earliest possible hour."

"Stony, don't!" Catriona protested. "He's not worth it!"

Stonecypher smiled at her. "Have to follow the law," he said. He extended his tongue, blurted, and announced, "As required by the Government, I accept your challenge."

"We'll record it!" Dan snapped. He stalked toward the green and

gold butterfly parked in a field of seedling Sudan grass. Horns rattled on the concrete rails of the pad-dock.

"Burstaard!" the bull bellowed.

Dan shied and trampled young grass under sandaled feet. His loosened cuirass clattered rhythmically. Raking the canopy of the butterfly, he slid out the radioak and started typing. Stonecypher and Catriona approached the hobbyist. Catriona said, "This is cowa'dly! Stony nevah fought a duel in his life. He won't have a chance!"

"You'll see me soon then, woman. Where'd you get all that equipment? You look like something in a circus."

"Ah used to be in a cahnival," Catriona said. She kept Stonecypher in place with a plump arm across his chest. "That's wheeah you belong," she told Dan. "That's all you'ah good fo'."

"Watch how you address a man, woman," Dan snarled, "or you'll end in the duelpen, too."

Stonecypher snatched the sheet from the typer. The request read:

Duelmaster R. Smith,
Watauga Duelpen, High-
land Park, Tennessee.
L. Dan challenges M.
Stonecypher. Cause: In-
terference with basic
anatory rights. July
1. 11:21 amest.

Stonecypher said, "The cause is a lie. You got no rights with Catriona. Why didn't you tell 'em it's because I knocked you eam-over-endways, and you're scared to fight without a gun?"

Dan shoved the request into the slot and pulled the switch. "I'll kill you," he promised.

While the request was transmitted by radiophotography, minutes passed, bare of further insults. Catriona and Stonecypher stood near the concrete fence enclosing the rolling top of Bays Mountain. Interminable labor had converted 650 acres of the top to arable land. Below the couple, the steep side of the mountain, denuded of timber, dangerously eroded, and scarred by limestone quarries, fell to the rag-ged shore of Kings Lake. Two miles of water agitated by many boats separated the shore and the peninsula, which resembled a wrinkled dragon with underslung lower jaw distended. The town of Highland Park clung to the jutting land, and the Highland Bullring appeared as a white dot more than four miles from where Catriona and Stonecypher stood. The ring-master's barge was a red rectangle skirting Russel Chapel Island.

Dan pulled the answer from the buzzing radioak. He walked over and held the radiophoto an inch from Stonecypher's long nose. It read:

Request OK. Time: July
4. 3:47 pnest.

Two attached permits granted each duelist the privilege of carrying one handgun with a capacity of not more than ten cartridges of not less than .32 caliber. Below the permits appeared an additional message:

L. Dan due at Watauga
Duelpen. 11:46 amest.

For duel with J.
George.

"Government and Taxes!" Dan cursed. Throwing Stonecypher's permit, he leaped into the green and gold butterfly and slammed the canopy. The four wings of the semi-ornithopter blurred with motion, lifting the craft into the sky. The forward wings locked with negative dihedral, the rear wings angled to form a ruddervator, and the five-bladed propeller whined, driving the butterfly in a shallow dive for the peninsula.

CATRIONA said, "Ah hope he's late, and they shoot him. Ah knew you'd finally have to fight, but—"

"You keep out of it next time," said Stonecypher. "I happen to know that feller's killed two women in the pen. He don't care for nothin'. Oughta know better than to let him come here. He made out like he wanted a guard dog, and I thought—"

"Nevah mind, Stony. Ah've got to help you. You nevah even fished a gun."

"Later, Cat. The ringmaster may want to stay for dinner. I'll look after the mules."

Catriona touched Stonecypher's cheek and went to the house. Stonecypher unharnessed the Appaloosa mules. While they rolled, he took, from an empty bay rack, a rubber-tipped spear and a tattered cloth dummy. The dummy's single arm terminated in a red flag.

Stonecypher concealed spear and dummy beneath the floor of the

dog house. Going to the paddock, he patted the bull between the horns, which had been filed to a needle point. "Still gain' through with it?" Stonecypher asked.

"Yaaaa," the bull lowed. "Yaaaa kuhl Daan. Err'll kuhl uhkh kuh-lerrr."

"All right, Moe. I'll kill Dan, and you kill the killers." Stonecypher stroked the massive hemisphere of the bull's jaw. "Goodbye, Moe."

"Goodba," the bull echoed. He lowered his nose to the shelled corn seasoned with molasses, the rolled oats, and the ground barley in the trough.

Stonecypher walked down the road to the staircase of stone that dammed the old Kingsport Reservoir, abandoned long before Kings Lake covered the city. A red electric truck crawled up the steep road hewn from the slope of the gap formed by Dolan Branch. When the truck had crossed the bridge below the buttressed dam, Stonecypher spoke to the fat and sweltering man seated beside the driver. "I'm M. Stonecypher. Proud for you to visit my farm. Dinner's ready up at the house."

"No, no time," smiled the fat man, displaying stainless steel teeth. "Only time to see the bull. I thought we weren't going to make that grade! Why don't those scientists develop synthetic elements, so that we can have atomic power again? This radio-electric is so unreliable! I am Ringmaster A. Os-well, naturally. This heat is excruciating! I had hoped it would be cooler up here, but something seems to have happened to our in-

land-oceanic climate this summer. Lead us to the bull, Stonecypher!"

Clinging to the slatted truck bed, Stonecypher directed the stoic driver to the paddock. The electric motor rattled and stopped, and Ringmaster Oswald wheezed and squirmed from the cab. The ringmaster wore a vaguely Arabic costume, in all variations of red.

The bull lumbered bellowing around the fence. His horns raked white gashes in the beech tree forming one corner. He tossed the feed trough to splintering destruction.

"Magnificent!" Oswald gasped. Then the ringmaster frowned. "But he looks almost purple. His horns are rather short."

"Stay back from the fence!" Stonecypher warned. "He's real wide between the horns, ringmaster. I reckon the spread'll match up to standard. Same stock my grandfather used to sell Boon Bullring before the war. Wouldn't sell 'im, only the tenants are scared to come about the house."

Oswald fingered his balloon neck and mumbled, "But he's odd. That long hair on his neck . . . I don't know . . ."

The bull's horns lifted the mineral feeder from the center of the paddock. The box rotated over the rails and crashed in a cloud of floured oyster shells and phosphate salt at the ringmaster's feet.

Oswald took cover behind the truck driver, who said, "Fergus'd like him. Jeeze! Remember dat brown and white spotted one he kilt last year on Forrest Day? Da crowd like ta never stop yelling!"

Ringmaster Oswald retreated far-

ther, as, under the bull's onslaught, a piece of concrete broke from the top rail, exposing the reinforcing rod within. "Fergus does like strange ones," he admitted.

Stonecypher said, "Don't let the mane bother you. There's one of these long-haired Scotch cows in his ancestors. He's not really purple. Just the way the light hits 'im."

Oswald chewed lacquered fingernails with steel dentures. His blood-shot eyes studied the spotted and speckled Appaloosa mules chasing around the pasture, but the sight failed to register on his brain. "The crowd likes a good show on Dependence Day," he proclaimed. "I considered trying a fat Aberdeen Angus with artificial horns for laughs, but this may do as well. I must find some shade! I'll take him, Stonecypher, if fifteen hundred in gold is agreeable."

"Sold," Stonecypher said. The word cracked in the middle.

While the ringmaster, muttering about trying bulldogs sometime, retired to the narrow shadow of the dog house, the driver backed the truck to the ramp. Stonecypher opened the gate and waved his handkerchief. The bull charged into the truck, and the driver locked the heavy doors.

From within his red burnoose, Oswald produced a clinking bag. "Fifteen hundred," he said. From other recesses, he withdrew documents, notebooks, and a pencil. He said, "Here is a pass for you and one for any woman-subject you may wish to bring. You'll want to see your first bull on Dependence Day! And here is the standard release absolving you of any damage

the bull may do. Oh, yes! His name and number?"

"Number?"

"Yes, his brand."

"Not branded. Make it Number 1. Name's Moe."

Oswell chuckled. "Moe. Very good! Most breeders name them things like Chainlightning and Thunderbird. Your GE number?"

"I'm not a Government Employee."

"You're not?" Oswald wheezed. "How unusual! Your colors? He'll wear your colors in his shoulder."

"Yeah. Black."

"Black?"

"Dead black."

Oswell, scribbling, managed a faint smile. "Sorry I can't accept that invitation to lunch." He struggled into the truck. "Hope this bull is brave in the ring. Nice antique old place you have here! I don't see a feed tower, but you surely don't use pasture—" The ringmaster's habbhe passed down the road with the truck.

Stonecypher watched the vehicle descend the dangerous grade. He lifted his square hat from his black hair, dropped it on the ground, and crushed the reeds under a booted foot.

The temporary house, a squat cubical structure, stood at the end of a spruce-lined path beside the ruin that a thrill party had made of the century-old farm house. The plastic screen squeaked when Stonecypher opened it. He stood on the white floor of the robot kitchen and dug a fifty dollar gold piece from the bag Oswald had given him. Glaring at the head of the woman with Liberty inscribed

on her crown, he muttered, "Thirty pieces of gold."

Catriona called, "Oswell's lucky he couldn't stay foah dinnah! Ah had the potassium cyanide all ready."

Stonecypher passed through the diner door into a room containing more yellowed history books and agricultural pamphlets than eating utensils. Catriona waited by the table. She held a large revolver in her right hand.

INTERMEZZO

STONECYPHER stood on Bay Knob, near the ruins of the old FM transmitter station, looking down at the Tennessee Lakes. Catriona sat behind him and held the revolver on her thigh. Stonecypher said, "I never see it but I wonder how it looked before the water."

Before him, North Fork, an arm of Kings Lake, twisted across the Virginia line four and one-half miles away, while to Stonecypher's right, Boone Lake sparkled like a gigantic, badly drawn V. He did not look toward Surgoinsville Dam securing Kings Lake far to the west.

The Tennessee Lakes were born in 1918 when Wilson Dam spanned the Tennessee River at Muscle Shoals, Alabama; but their growth was retarded for fifteen years, until an Act of Congress injected them with vitamins. Then the mile-long bastions of concrete crawled between the ridges. Norris, Wheeler, Pickwick Landing, Guntersville, Watts Bar, Kentucky, Cherokee,

Fort Henry, Boone, Sevier, Surogoinsville—almost innumerable dams blocked the rivers. The rivers stopped and overflowed. The creeks swelled into rivers.

Congressional Committees investigated, the Supreme Court tested the dams against the Constitution, ethnologists and archeologists hastily checked for Indian relics; and the dams, infused with youthful vigor, matured. Beginning with Norris, which backed up the Clinch and Powell Rivers to inundate 25,000 acres and displace 3,000 families, the dams expanded mighty aquatic muscles. The Tennessee, the Little Tennessee, the Nolichucky, the Holston, the French Broad, the Watauga, the Hiwassee, the Little Pigeon—all the rivers spread their waters into lengthy, ragged lakes, changing the map of Tennessee more than any natural cataclysm, such as the great earthquake of 1811, had ever done. The Lakes provided jobs, electric power, flood control, soil conservation, a fisherman's paradise, milder winters, cooler summers, and they covered all the really good farming land in the eastern part of the state.

Catriona loaded the revolver. It was an obsolete .357 Magnum with a 6½ inch barrel, and the cartridge cases of the metal-piercing bullets had a greenish sheen. "Now, put it in the holster, and be careful," Catriona said.

Stonecypher wore the holster, a leather silhouette studded with two spring clips opening forward, on a belt and secured to his leg by a thong. Gingerly, he took the revolver and slipped it under the

clips. "I've kept outa duels all my life," he said, "but, so long as it's for you, I don't much mind."

"Ah'll mind if he kills you. You do like I tell you, and you can beat him. Why, mah best act in the How-To Carnival was How to Win a Duel. Cou'se, they didn't know ah was really drawin' befoah the buzzah sounded. Why, ah used to set two plates ten yabds apaht, draw two revolvahs, and shoot both plates, all in foah-tenths of a second!"

Stonecypher grinned. "Sorry I missed that carnival first time it came through here. I coulda seen you in that costume they poured on you, three years earlier."

"Nevah mind the veiled compliments. Now, try it!"

Stonecypher faced the target, a sheet of plastiboard roughly sawed to the shape of a man, and backed by a heap of earth removed from the new, as yet dry, pond in which they stood. Catriona pressed a small buzzer concealed in her palm. Stonecypher's big hand closed on the revolver butt, pushing the weapon up and forward. The sound of the shot rattled away over the mountain top.

"That's good!" Catriona cried, consulting the sonic timer. "One and two-tenths seconds from buzzah to shot!"

"But I missed," Stonecypher protested. "Look bad on teevee."

"You'll hit him. Watch the recoil next time."

Stonecypher drew and fired a second wild shot. He snorted, "Confound Westerns, anyhow!"

"Weste'ns?"

"Sure. That's where this duelin'



started. Used to, almost ever' movie or tepee was called a Western. Sort of a fantasy, because they were just slightly based on real history. They generally showed a feller in a flowered shirt, ridin' a Tennessee Walking Horse, and shootin' a gun. Ever'body in these Westerns had a gun, and they all shot at each other.

"The youngin's were hep on 'em, so they all wore toy guns, and a whole generation grew up on Westerns. When they got big, they carried real guns. I've heard my great-uncle tell about it, how before the Government built duel-pens and passed laws, you couldn't hardly cross the Lakes without runnin' into a bunch of fools on water skis shootin' at each other."

"You leave the histo'y books alone foah awhile," Catriona commanded, "and practice. The tenants and ah'll tend to the wo'k. Try it loaded and empty. Hook this little buzzah to the timesah, and practice. Ah've got to go see the chickens."

"Bye, teacher." Stonecypher dropped the buzzer in his pocket and watched her vanish into the grove. He fired the remaining shots, nicking the target once. With the revolver holstered, he followed the path to the summer pasture.

BELLY-DEEP in red clover, twenty-four cows, twenty-four calves, and twenty-four yearlings grazed or played in the shady field.

Stonecypher cupped his hands around his mouth and yelled, "Smart-calves! Smart-calves to school!"

The entire herd turned sorrowful eyes on him. Seven of the calves and four of the yearlings trotted to the gate, which Stonecypher held open, and jostled out of the pasture. As the calves began to lie down under the trees, a white heifer-calf nuzzled Stonecypher's hand and bawled, "Paaapy gyoing a fyightt?"

"Yeah, he's goin' to fight," Stonecypher answered. "Your pappy's gone to the bullring. He suggested it, and made the choice himself. He's got real courage. You oughta all be proud of him."

The calves bawled their pride. Including those remaining in the pasture, they presented a colorful variety of spots, specks, splotches, browns, reds, blacks, and even occasional blue and greenish tinges. Stonecypher sat facing them from a stump. He said, "I'm sorta late for the lesson, today, so we'll get on with it. Some of this will be repetition for you yearlings, but it won't hurt. If you get too bored, there's corn and cottonseed meal in the trough, only be quiet about it."

"Now. To look at you all, nobody would think you're the same breed of cattle; but you, and your mammys, and Moe are the only Atohmny cattle on Earth. It's usually hard to say exactly when a breed started; but you all started a long, long time ago, on July 16, 1945, near Alamogordo, New Mexico, when they exploded the first Atomic Bomb."

At mention of Atomic Bomb,

who had succeeded the Boggler Man as a means of frightening children, one of the younger calves bawled. Her polled, brindled mother ran in ungainly fashion to the fence and mooed with great carrying power.

"All right!" Stonecypher yelled. The cow closed her big mouth, but stayed by the gate. "Can't go by what you hear the tenants tell their kids," Stonecypher cautioned the calf. "Atomic Bomb is as dead as the tank and the battleship."

"Now, like I was sayin', the scientists put Atomic Bomb on a hundred foot tower and blowed him up. There was a flash of fire, and an awful racket, and the blast raised up a lot of dirt and dust from the ground. All this dust achurnin' around in the cloud bumped into little bits of metal and stuff that was highly radioactive. That means, the basic atoms of matter had been thrown out of kilter, sorta deranged. The protons and electrons in an atom oughta be about equal for it to be stable, but these were shootin' off electrons, or beta particles, and givin' off something like powerful x-rays, called gamma rays, and things like that."

"Anyhow, this radiation affected all the sand and bits of rock and dirt in that bomb cloud. This radiation is dangerous. Some of it will go right through several inches of lead. Enough'll kill you. Your ancestors were ten miles or so from where Atomic Bomb went off."

"They were just plain Whiteface cattle. They weren't supposed to be there, but I reckon none of the scientists bothered to warn 'em. The

dust started settlin' all over your ancestors. In about a week, there were sores and blisters on their backs. The red hair dropped off. When it grew back, it was gray.

"The scientists got real excited when they heard about it, 'cause they wanted to see how horrible they could make Atomic Bomb. So, they shipped fifty-nine cattle up to Oak Ridge. That was a Government town, a hundred miles south-west of here, where they made some of the stuff to put in Atomic Bomb. The University of Tennessee was runnin' an experimental farm there. They had donkeys, and pigs, and chickens, and other animals that they exposed to radioactivity. Then they killed 'em and cut 'em up to see what had happened. I know it's gruesome, but that's how it was.

"The awful fact is, the scientists slaughtered more than half that original Atohmy herd for experiments. Some of the rest, they—uh—married. Wanted to see if the calves had two heads, or something; if radioactivity had speeded up the mutation rate.

"Back then, they didn't understand much about mutation. Some claimed a little radioactivity would cause it, some said a whole lot, and some said it wouldn't hurt a bit."

"Whaa mootyaaonn?" asked the calf which was not yet assured of the extinction of Atomic Bomb.

"Well, you-all are all mutations. I've told you how life starts from one cell. This cell has thread-like things in it called chromosomes, and the chromosomes are made up of things called genes. Mutations, sort of unexpected changes, can take

place in either the chromosomes or the genes. You see, when this one cell starts dividing, every gene makes a copy of itself; but, sometimes, the copy is a little different from the original. Lots of things, like x-rays and ultraviolet rays, heat, chemicals, disease, can cause this. Radioactivity had caused mutation in some experiment, so the scientists were anxious to see what happened with these cattle.

"Genes determine the way an animal develops. Two mutant genes can start reactions that end up as a man with one leg, or maybe as a bull with the intelligence of an eight-year-old man. Lots of mutations are recessive. They may be carried along for generations. But, when two like mutant genes come together in reproduction, the animal is bound to be something different, the way you eleven calves are.

"Now. The scientists watched the Atohmy cattle for fifteen or twenty years, and nothin' much happened. They started sayin' radioactivity wasn't dangerous, and a man could walk into a place right after Atomic Bomb went off, and it wouldn't matter. They should be here to see the mess in Japan today. All the time, though, I think the cattle were changing. It may have been in little things like the length of hair, or the shape of an eyeball, or the curve of a horn, so the scientists couldn't tell without they made exact measurements all the time.

"Then, a bull-calf was born. He had shaggy black hair, and his horns grew in a spiral like a ram's. Some scientists said, 'I told you so!

It speeded the mutation rate!

"Others said, 'He's a natural mutation, or else, a throw-back to prehistoric wild cattle. It happens in every breed. Atomic Bomb had nothing to do with it.'"

"They married the bull, and then they fixed to slaughter 'im to see what his insides was like. The bull fooled 'em, though. He came down with contagious pleuro-pneumonia, the first case in years, 'cause it was supposed to have been wiped out in this country away back in the Nineteenth Century. They had to cremate the bull for fear the disease would spread. Ever' one of the calves were normal Whitefaces.

"Finally, the nineteen Atomic cattle that were left were put up for sale. My great-grandfather, Cary McPheeter, bought 'em and shipped 'em here to Bays Mountain. He's the man started this farm where there was nothin' but rattle-makes, and trees, and rocks."

"Whyy theyea sell um?" a red roan calf interrupted.

"Well, they sold 'em 'cause Oak Ridge had been condemned. That was several years after the German Civil War. It was peace time, for a change, and folks were sick of Atomic Bomb. Anyhow, new, modern plants for makin' the stuff had been built in secret places a lot easier to defend. The women were cryin' for more automatic kitchens, so the Bureau of Interior Hydro-electric Power (that's the name Federal Power, Inc., went by then) put another dam across the Clinch River below Norris. Bush Lake covered up Oak Ridge.

"There wasn't much mutation, except for color, in you Atomic cat-

tle, till seven years ago when your pappy, Moe, was born. I remember—"

A hoarse excited voice shouted from a distance. "Thrill party!" it cried. "Thrill party!"

STONECYPHER leaped off the stump, stamped his right foot to restore circulation, and yelled on the run, "That's all today! Stay under the trees!"

He loped along the pasture fence and across the makeshift target range. Two tenants, Teddy and Will, stood on the dirt heap with pitchforks in their hands. Over Bay Knob, an old Model 14 butterfly hovered on vibrating wings. Sloppy white letters on the sides of the aircraft spelled such slang expressions as, "Flash the MAGNETS," "SuperColossalSonic Flap ship," and "Redheads amble OTHER canop."

An impossible number of middle-school-age boys bulged from the cabin windows. Methodically, they dumped trash and garbage over the transmitter station ruins. The butterfly wheeled and flapped over the pasture. Red clover bent and writhed in the artificial wind from the ornithopter wings. Cows bawled and ran wild. Calves fell over each other.

Stonecypher jumped the fence. He wrested the revolver from the holster. "Clear out, or I'll shoot!" he howled.

Voices spilled from the butterfly. "He got a handgun!"

"Dis ain't legal!"

"Whatcha say, tall, bones, and ugly?"

Stonecypher aimed the Magnum

at the shaven head in the pilot's seat. The boys looked faint. Agitated air thundered as the butterfly lifted straight up two hundred feet and glided away in the direction of Surgoinsville Dam.

Teddy and Will stood by with pitchforks unrelaxed. Will spat a globule of tobacco juice. "The thangs these here psychologists git made law!" he sneered. "You want me to make out a Thrill Damage Claim?"

"No, Will," Stonecypher said, "just deduct it from taxes."

Teddy looked at the revolver and said, "Ever'body oughta take guns to them crazy youngin's. Reckon you'll git into trouble?"

"No. It's an empty antique. That's legal. You guys did all right. Let the calves back in, huh?"

The tenants left by the gate, and, with a minimum of driving, urged the calves into the pasture. Stonecypher watched the men pass through the grove. Although the tenants undoubtedly recognized the peculiarities of the calves, they never mentioned them. Since the late 1700's, through Revolution, Civil War, automobile, the Department of Internal Revenue, the multiple bureaus that had controlled the Lakes, the Moon rocket, and the expedition to Pluto, these people had remained suspiciously interested in strangers, suspicious of indoor plumbing, doubtful of the Government, quick-tempered, and as immovable as Chimney Top. They had exchanged little except log and frame houses for concrete. The tenants, not really tenants, had been squatting on Bays Mountain when Cary McPheeter bought

the farm; and there they stayed.

Stonecypher vaulted the fence. Catriona, with hands firmly planted on hips, stood in the dry pond. Stonecypher said, "If I just knew what these thrill parties think they're up to, it might help."

Catriona shook her head of red-yellow hair. "Nevah mind them. Ah told you to practice shootin', but the minute ah turn mah back, you run off and staht teachin' those calves! You've got to practice, Stony! You've nevah done any shootin', and L. Dan's killed ten people. Ah—"

"Watch the tears, or you'll have red and green eyes," Stonecypher said. Clumsily, he ejected the shells and reloaded the revolver. He occupied two seconds in drawing and firing. The bullet struck dirt a yard to the left of the target.

SONATA

A SHORT vicious thunderstorm lashed Bays Mountain on the afternoon of July 3. As the storm passed, a blood-red butterfly, with a pusher propeller in the tail and a plastic bull head on the nose, descended in the young Sudan grass. Stonecypher dropped the saw—he had been clearing away a beech limb the storm left in the abandoned paddock—and strolled to greet Ringmaster A. Oswald.

"Stonecypher!" the ringmaster announced. "That storm almost caught us!" Oswald's stainless steel teeth clacked, and the breezes trailing the thunderclouds ballooned his orange silk kimono. "I never liked these butterflyers.

They're too slow, and that swooping motion! Five hundred miles per hour may seem fast to a man your age; but in my day, back before petroleum was classified as armament, we had jets! Real speed!"

"Come on up to the house, ringmaster," Stonecypher invited. "I'll mix up some dextrose and citric acid."

"No, no time," the fat man panted. "Only time to see you about that bull you sold me. The storm took a limb of your beech tree! Almost the only one left, I suppose. About that bull, Stonecypher, you know I was a bit hesitant when I bought him, but my driver talked me into it. I'm so disappointed I had him drafted immediately!"

"But, what—" Stonecypher attempted to ask.

"The young woman there in the butterfly is a much better driver and pilot," Orwell babbled. "I wouldn't have believed it of a woman! She weighs a good ninety-eight pounds, too! That bull—he has changed completely since we put him under the stands. He eats well, but he shows no spirit at all. Tomorrow is the big day, Stonecypher! I can't disappoint the crowd! I thought he might be sick, but the vet says not. That bull let the vet come into the cage and made absolutely no attempt to kill him!"

"But does Fergus—"

"Fergus's manager saw the bull! He's all for it. Fergus made an extremely poor showing on Memorial Day, and the manager thinks this odd bull would provide a real comeback! I advised against it. This heat is terrible! The storm didn't

cool the air at all."

Stonecypher maneuvered the perspiring ringmaster into the shade of the beech. He said, "I wanta do the fair thing with you, ringmaster, so I'll give you a guarantee, in writing if you want. If that bull's not the bravest ever fought in Highland Bullring, I give you double-money-back."

Oswell's face wobbled in a tentative smile. He counted his stubby fingers. "Double-money-back?"

"Yeah. I wanta get into the business. My grandfather used to sell bulls. Then my father came along, and he wouldn't sell a one."

"Yes. Yes, I once tried to reason with him, but—"

"He had funny ideas," Stonecypher pressed his advantage. "I never did understand the old man myself. He used to lecture me on something he called the Man-Animal War. He said one of the worst things in the war was the thousands of bulls that had been tortured to death."

"Peculiar idea. Of course—"

"He claimed bullfights slipped up on this country. Back when it wasn't legal, they spaded up the ground real good. There were movies, and books, and magazines, and foreign broadcasts, all ravin' about how brave and noble it was for a bunch of men to worry and torture a stupid animal like a bull, till he couldn't hardly hold his head up, and then run a sword in 'im."

"Naturally, you—"

"I don't know how many times he told me a bull had more brains than a horse, but less than a jackass. He said bullfightin' wasn't a sport, even if the bull got a man

sometimes; and he had the idea the worst thing was the four or five horses, that ever' bull killed, took with 'im. They had some bloodless bullfights in California, and the nut colonics out there like it so good, first thing you know, we really had it. It came to East Tennessee 'cause this was one of the biggest cattle-raisin' sections, before the Lakes took the grazin' land."

"Surely, Stonecypher, you—"

"My father always claimed if the bullfighters were near as brave as they said, they'd take on a really intelligent animal sometimes, like a man-eatin' tiger. He even thought a man was mentalill to fight a bull in the first place." Stonecypher grinned. "No, you don't need to worry about me, ringmaster. I hate to admit it, but the old man is the one who was mentalill."

Oswell revealed all of his steel teeth in a broad smile. "You had me worried!" he wheezed. "Now, your offer."

"I'll go even better," Stonecypher said, "just to show how set I am on gettin' back in the business. If Moe's not brave, I got two yearlin's you can have for free."

"How generous! You've reassured me, Stonecypher. I have confidence, now, that the show will be a great success! I must go! You have no conception of the life a ringmaster leads before a fight. I won't require a written guarantee. I trust you, Stonecypher! See you tomorrow, I hope! I never liked July. If the Government would only make more Lakes, it might cool off! I hope—"

The whir of the red butterfly's wings terminated Oswell's dis-

course. With a face like a gored bullkiller, Stonecypher watched the ringmaster's departure. Another butterfly hovered above the mountain. This one was green and gold with the canopy pushed back and a glint of twin lenses in the cockpit.

Will appeared at Stonecypher's side. He spat in a long arc and said, "That's a new one, ain't it, peepin' from a butterfly? I reckon L. Dan never got kilt in that other duel like I hoped he would. You want us to git you outa this, Stonecypher?"

"No, Will."

"We can see you git to the Snokies. The Givernment'll never find you down in there."

"I'll be all right, Will. If he does kill me, take care of Catriona. And look after the calf records."

"Sure thang."

Stonecypher walked slowly toward Catriona's open-topped sunbathing tent.

DANSE MACABRE

DUELMaster R. Smith adjusted his black tam. "Do not touch your shooting hand to your weapon until the buzzer sounds," he instructed. "Otherwise, the weapon may be carried as you wish. At the slightest infringement of the rules, a robot gun will kill you. If you have any elaborate last words, say them now; because the pen is soundproof." He laughed an obviously much rehearsed laugh.

L. Dan wore orange tights today, but no armor, since the rules required deullists to present naked

torsoes for probable bullets. Stonecypher faced the duelmaster. "I reckon this room is the only place a man really has free speech," he said. "You're dead, and can't see good enough to read lips, and me or him will soon be dead."

"I don't believe in this duelin'. It gives a man who's wrong a chance to kill one who's right. A man shouldn't oughta have to die because he's right. Just like ever'-thing else in this Manly Age. It's painful. That oughta be our motto, More Pain, just like in the Machine Age it was More Gadgets At Any Cost."

"Why don't you go on tevee?" Dan jeered. "She'll soon forget you, farmer."

Stonecypher's words rolled over the hobbyist. "I reckon the Manly Age came because a man started thinkin' he wasn't much of a man any more. He was just as fast as his car, and just as strong as his electric lawn mower. And a loud minority of the women was claimin' they could do anything a man could, and maybe better. So the men started playin' football in shorts and huntin' each other on game preserves, and the women went back to the kitchen and bedroom. Lots of things that went on undercover come out in the open. Cockfights, dogfights, coon-on-a-log, duels, stallion fights, bullfights."

"And people like you, L. Dan, went on livin'. You got no right to live. You don't do any useful work. The Earth is slowly starvin', and you take the grub out of some feller's mouth who might could help a little. That's why—"

"Time!" announced the duel-

master with his face close to a large clock on the wall. He opened the door. Two men carrying a body on a stretcher passed. The body had four bullet wounds in it.

Dan said, "That drivet gives me a real reason to kill you, farmer. I'll be good to her for a few days."

As prearranged, Dan took the right branch of the corridor and Stonecypher, the left. A hooded man gave Stonecypher the Magnum revolver and shut him into a space resembling a windowed closet with a door on either side. Stonecypher secured the revolver in the clip holster. His bony hands formed knotted fists.

The pen door slid back. Stonecypher stepped into a room thirty by ninety feet with three bullet-marred concrete walls and a fourth wall of bulletproof glass, behind which sat the ghoulissh audience. Dan, crouched and with his pistol in the crook of his left elbow, advanced. His right hand fluttered an inch from the pistol butt.

Stonecypher, grotesque with thin chest exposed and overall bib wrapped around belt, waited. Two photoelectric robot machine guns followed each movement of the duelists. A buzzer sounded. Dan's index finger failed to reach the trigger, for a guardian machine gun removed the hobbyist's head in a short efficient burst. The noise of a louder buzzer punctuated the execution.

When the soundproof inner door of the closet opened, the hooded man, who had a pair of crossed pistols tattooed on the back of his right hand, said, "He was too anxious."

"Yeah," Stonecypher grunted.

The man watched Stonecypher pass out to the street. Stonecypher snapped up the bib of his overalls. An extremely rare bird, a robin, hopped from his path and continued a fruitless search for insects. Stonecypher walked down Watauga Street until the pavement vanished under the brownish-green water of Kings Lake.

Catriona squealed when she saw him. Ignoring all Correct Procedures, she almost knocked him down and attempted to smother him. "Ah told you it just took practice!" she blubbered. "You did it, Stony!"

With muffled mumbles, Stonecypher managed to put her in the Tenite canoe. The few people along the quay, who had witnessed the illegal manner of their meeting, watched with shock, or with incredulity, or with guarded admiration. When they saw that Stonecypher's hand rested on a holstered revolver, they lost their curiosity.

Wading, Stonecypher shoved the canoe off and hopped aboard. As he took up the paddle, his hand trailed in the water and released the small buzzer that had made possible Catriona's best carnival act.

FOR July, the afternoon was cool. Blue-gray clouds drifted before larger dirty white masses. To the southwest opened the mile-wide mouth of Horse Creek; and, far beyond, the great blue pyramid of Chimney Top Mountain stood defiantly above Sevier Lake. The world seemed water broken only by partly submerged hills and mountains.

Stonecypher gazed across the Lake at Bays Mountain and at the five Cement Islands apparently floating against that backdrop. Softly, he said, "Some folks call the big one Martyrs Island. There's a marble pillar right in the middle. Nobody knows who put it there, and the Government never bothered to knock it down. I reckon the poison ivy's covered it by now, but I went and read the inscription, once, when I was a boy. It says:

"They moved me off the Powell River.

They covered my farm with water.

I bought me another near Beans Station.

The water covered it.

I was getting old, but I built at Galloway Mill.

When they flooded that, I gave up and lived in Kingsport.

I will not move again."

The canoe bounded over the choppy water, one hundred feet above the silted streets of the flooded city of Kingsport. Stonecypher said, "The time I was there, you could still find a few copter-trooper helmets and old cankered shells. Couple of years back, a diver brought up two skulls off shore."

Catriona's eyes remained moist, but she smiled. Her teeth were beautiful. "It'll be all rahght, Stony. You can't change the world in one day. You did fine, and Moe will too."

"I told you to stay at the bull-ring," Stonecypher said.

"Ah couldn't watch that! And those puny, little, mousy women stare and talk about me, because theah's a little meat on mah cah-

can. Orwell said Moe would be last, anyhow. Ah was so wofied about you, ah couldn't sit still."

Only a few boats, mainly those of piscatorial maniacs, were on the lake. Stonecypber glared at them and muttered, "I hope I did right by Moe. He wanted to fight. Maybe, Catriona, if I'd had you when I found out he could talk—not just mimic—I'd of raised him different. Maybe I shouldn't have shown him that bullfight movie, but I wondered what the only hull to see a bullfight from outside the ring thought about it.

"That led him to wantin' to know all about the Man-Animal War. I told him the best I could, how one of a man's basic drives is to exterminate, ever' since prehistoric times when he did in the wooly mammoth and rhinoceros. The dodo, quagga, passenger pigeon, great auk, aurochs, Key deer, bison, African elephant, gorilla, tiger—there's an awful list. Why, five hundred species of mammals, alone, have become extinct since 1 A. D., 'bout four hundred of them since 1850. A man'll even kill off other men, like the Neanderthals and the Tasmanians!" Stonecypber rested the paddle and ginned, faintly, at Catriona reclining in the bow. "I guess you've heard this before."

"Go rahght ahead, Stony," Catriona sighed. "Ah like to hesh yoah speech. It's the only time you really get angry, and you look so fine and noble."

"Yeah. Well. I told Moe how a man exterminates useful or harmless species, and then he lets dangerous ones, like rats, eat him out of house and home. Course, I ex-

plained this was just kinship. Folks used to argue man come from a monkey, or from spontaneous combustion, or something. Now we got fossil proof he's not like anything anybody ever saw. He's a case of straight line development all the way back to the first mammal, a sort of rat."

The canoe glided past Highland Pier. Every type of small watercraft, from a punt, through an electric motorboat, to a sloop, had docked. More boats lined the shore on either side of the pier. The flying field contained so many butterflies and copiers that there seemed no possibility of any of them taking off. Human voices welled in a mob roar from the great open cylinder of the bullring. A huge banner draped on the curving white wall proclaimed, in ten-foot letters:

DEPENDENCE DAY
BULLFIGHT
HONOR THE GREAT
GOVERNMENT ON WHICH
WE DEPEND
SIX BULLS—THREE KILLERS

Stonecypber ran the canoe aground in a patch of dead weeds, exposed by a slight lowering of the lake level, and helped Catriona over the rocks that lined the bank. He said, "I told Moe other things men do to animals. All the laboratory hutchery, done because it would be cruel to treat a man like that, but it's all right with a animal, like takin' out a dog's brains and lettin' 'im live. I told him about huntin', how the kudu become extinct 'cause a bunch of fools wanted to see who could kill the one with

the biggest barns.

"I told him the things done to domestic animals. Dehornin', emasculatin', brandin', slaughterin' with sledge hammers and butcher knives, keepin' 'em in filthy barns. A man tells himself he's superior to other animals. If he does somethin' bad, he uses words like inhuman, brutal, animal instincts, instead of admittin' it's just typical behavior. And the psychologists take some animal, say a dog, and put him in a maze, something the dog never saw before. If the dog don't run the maze in two seconds flat, they say he's a pretty stupid animal. He just operates on instinct, but they can't say how instinct operates. They'll have a time explainin' Moe's instincts.

"I reckon the American bison made Moe madder than anything. They killed the bison off, 'cept for protected herds, in the Nineteenth Century. A hundred years later, the herds had got pretty big, so they declared open season on bison. No more bison."

A recorded voice growled, "No guns permitted in ring. Deposit gun in slot. No guns permitted in ring."

Stonecypher moved his permit in ineffectual passes before the electric eye. He shrugged, dropped the revolver into the slot, and left his thumb print. Catriona displayed the passes Ringmaster Oswald had given them. The teever blinked, and the gate granted admission. They rode the escalator to the sixth tier and squirmed through pandemonium to their seats.

The male portion of the crowd wore every possible style and color of dress, in complete emancipation

from the old business suit uniform, but the women wore sober false-bosomed sundresses and expressed excitement in polite chirps. Stonecypher pressed his mouth against Catriona's ear and whispered through the din, "You got to understand, Cat, whatever happens, Moe wanted it. He says he can scare some killers into givin' up bullfights and maybe help stop it."

"He'll do fine, Stony."

Several spectators stopped venting their wrath on the unfortunate man in the ring to gawk at the couple. Catriona's unorthodox physique aroused sufficient amazement; but, in addition, Stonecypher gave her the front seat and took the rear one, the correct place for a woman, himself.

Below, through a rain of plastic bottles and rotten eggs, a tired man walked to the barrier which Oswald advertised as the only wooden fence in seven states. Behind the killer, a small electric tractor dragged out the bloody carcass of a bull.

A gasping, gibbering little man grabbed Stonecypher's arm and yelled, "Illard is the clumsiest killer, he ran the sword in three times, and the kid with the dagger had to stick twice before they finished, Big Dependence Day Bullfight my jerl! This is the worst in years, Fergus made the only clean kill all afternoon, and I flew every one of eighteen hundred miles myself to see it, this last bull better be good!" The little man waved his bag of rotten eggs.

Although the bullfight followed the basic procedures established by Francisco Romero in the Spain of

1700, changes had occurred, including the elimination of all Spanish words from the vocabulary of the spectacle since the unpleasant dispute with the Spanish Empire twenty years before. The gaudy costumes worn by participants had been replaced by trunks and sneakers.

A purring grader smoothed the sand. The crowd quieted, except for those near the box of Ringmaster Oswald. They suggested in obscene terms that their money be refunded. A trumpet recording blared. A scarlet door, inscribed, "Moe of Rays Mountain Farm," opened. The crowd awaited the first wild rush of the bull. It failed to materialize.

GRAND FINALE

SLOWLY, Moe came through the doorway. Above, on a platform inside the barrier, stood a gray-haired man who stuck identifying, streamered darts into bovine shoulders. His hand swept down, carrying Stonecypher's chosen colors, black.

Moe's walk upset the man's timing. His arm moved too soon, Moe's front hooves left the ground. Horns hooked. The gray-haired man screamed and dropped the dart. With a spike of horn through his arm, between bone and biceps, he gyrated across the barrier. He screamed a second time before cloven hooves slashed across his body.

The crowd inhaled, then cheered the unprecedented entrance. Kill-

er Fergus's team stood rigid, not comprehending. Then men dashed through shielded openings in the barrier, yelling and waving pink and yellow capes to draw the bull from his victim.

Moe ignored the distraction, trotted nonchalantly to the center of the ring, and turned his bulging head to examine the spectators jabbering at his strange appearance. The short horns, the round skull, the white-banded eyes, the mane that seemed slightly purple under the cloudy sky, and the exaggerated slope from neck to rump that made the hind legs too short—together they amounted to a ton of muscle almost like a bull. "Where'd you trap it, Oswald?" someone near the ringmaster's box yelled.

Forgetting the mess Illard had made with the previous bull, the crowd commented. "It's the last of the blon!"

"He's poiple! Lookit! Poiple!"

"The bull of the woods!"

"Howya like 'im, Fergus?"

Killer Fergus posed behind the barrier and studied his specialty, an odd bull. Two stickers, Neel and Tomas, flourished capes to test the bull's charge, with Neel chanting, "Come on, bull! Come on, bull! Come on! Bull, bull, bull!"

Moe did not charge. He moved, in a speculative walk, toward the chanting Neel who tantalized with the cape and retreated with shuffling steps. The charge, when it came, occurred almost too fast for sight. Neel wriggled on the horns, struck the sand, and the horns lifted him again. He smashed against the barrier. Tomas threw his cape over the bull's face. The

left horn pinned the cape to Tomas's naked chest over the heart.

Moe retired to the center of the ring and bellowed at the crowd, which, delirious from seeing human blood, applauded. Blood covered Moe's horns, dripped through the long hair on his neck, and trickled down between his eyes.

Quivering helpers removed the bodies. The first lancer, livid and trembling, rode a blindfolded horse into the ring. "He'll fix this horse!" the crowd slavered. "We'll see guts this time!"

Moe charged. The lancer backed his mount against the barrier and gripped his weapon, a stout pike. Sand sprayed like water as Moe swerved. On the left side of the horse, away from the menacing pike, Moe reared. The lancer left the saddle. A tangle of naked limbs thrashed across the wooden fence and thudded against the wall of the stands.

Twenty-five thousand people held their breaths. The blindfolded horse wailed with dilated nostrils and every muscle vibrating in terror. Moe produced a long red tongue and licked the horse's jaw.

Fergus dispersed the tableau. Red-haired, lean, and scarred with many past goings, the popular killer stalked across the sand dragging his cape and roaring incomprehensible challenges. In the stands, the cheer leaders of the Fergus Fanclub lead a welcoming yell. "Yeaaaa, Fergus! Fergus! Fergus! Rah, rah, rah!"

Moe wandered through the helpers trying to distract him from the horse and looked at the killer. Fer-

gus stamped his foot, shook the cape, and called, "Bull! Come on! Charge!" Moe completely circled the killer, who retired in disgust when another lancer rode into the ring. "Stick him good!" Fergus directed.

The pike pointed at the great muscles of Moe's back, as the bull charged. Moe's head twisted in a blur of violence. Teeth clamped on the shaft behind the point. Too surprised to let go, the lancer followed his weapon from the saddle. He released his hold when Moe walked on him.

Like some fantastic dog stealing a fresh bone, the bull trotted around the ring, tail high and pike in mouth. The crowd laughed. Wild-eyed men carried out the trampled lancer.

A third, and extremely reluctant, lancer reined his horse through the gate. A pike in the mouth of a ton of beef utterly unserved the man. He stood in the saddle and jumped over the barrier where a rain of rotten eggs from the booing fans spattered him thoroughly.

AN UNINJURED bull pawed alone in the sand when the trumpet recording announced the end of the lancers' period. The crowd noises softened to a buzz of speculation, questions, and comment, as the realization that weird events had been witnessed slowly penetrated that collective mind. The bull had not touched a horse, no pike had jabbed the bull, and five men had been killed or injured.

"Great Government!" a clear

voice swore. "That ain't no bull, it's a monster!" This opinion came from a sticker in Illard's team. Fergus attempted to persuade the man to help, since both of Fergus's stickers were dead. Part of the crowd agreed with the sticker's thought, for people began moving furtively to the exits with cautious glances at the animal in the ring. They, of course, could not know that the bull had been trained, with rubber-tipped pikes and dummies, in every phase of the bullfight; that he knew the first, and only, law of staying alive in the ring. "Charge the man and not the cloth."

The clouds that had obscured the sky all day formed darker masses tinted with pink to the east, and the black dot of a turkey buzzard wheeled soaring in the gloom. Carrying, in either hand, a barbed stick sparkling with plastic streamers, Fergus walked into the ring. His assistants cautiously flanked him with capes.

Moe dropped the pike and charged in the approved manner of a bull. Fergus raised the sticks high and brought them down on the humped back, although the back was not there. The sticks dropped in the sand.

As the killer leaped aside in the completion of a reflex action, a horn penetrated the seat of his trunk. The Fergus Fanclub screamed while their hero dangled in ignominy from the horn. Moe ignored the flapping, frantic capes. The killer gingerly gripped a horn in either hand and tried to lift himself off. Gently, Moe lowered his head and deposited the man beside an opening. Fergus scrambled to

safety like a rat to a hole.

Four helpers with capes occupied the ring. When they saw death approaching on cloven hooves, two of them cleared the fence. The third received a horn beside his backbone and tumbled into the fourth. A dual scream, terrible enough to insure future nightmares, echoed above the screeching of the crowd. Moe tossed the bodies again and again across the bloody sand.

Silence slithered over the Highland Bullring and over a scene reminiscent of the ring's bloody parent, the Roman Arena. Men sprawled gored, crushed, and dead across the sand. A section of the blood-specked barrier leaned splintered and cracked, almost touching the concrete wall. Unharmed, Fergus stood on one side of the battleground, Illard on the other.

Fergus reached over the wooden fence for red flag and sword. Turning his back on the heaving Moe, who stood but ten feet behind, the killer faced the quaking flesh that was Ringmaster Oswald, high up in the official box. The killer's voice shook, but the bitter satire came through the sound of departing boats and aircraft. Fergus said, "I dedicate this bull to Ringmaster Oswald who has provided for us this great Dependence Day Bullfight in honor of the Great Government on which we all depend." He turned and faced the bull.

Moe, for once, rushed the red flag, the only thing that made bullfights possible. His great shoulders presented a fair target for the sword.

Fergus, perhaps the only bull-

fighter ever to be gored in the brain, died silently. The sword raked a shallow gash long Moe's loin.

In the sixth tier of the stands, saliva drooled from the slack mouth of the little man seated beside Stonocypher. "Now's your chance, Ilard!" the man squalled. "Be a hero! The last of the bull-fighters! Kill him, Ilard!"

Ilard walked on shaking legs over bodies he did not see. He was short, for a killer, and growing bald. He picked up the sword Fergus had dropped, looked into the gory face of the bull, and toppled in the sticky sand. The sword quivered point-first beside his body.

RECESSIONAL

A WIND whipped down into Highland Bullring. Riding the wind, blacker than the clouds, the inquisitive turkey buzzard glided over the rim of the stands with air whistling through the spatulate feathers of rigid wings. The buzzard swooped a foot above Moe's horns and soared swiftly over the opposite side of the ring.

That started the panic, although Moe's charge accentuated it. He crashed into the sagging section of the barrier. Cloven hooves scraped the wooden inclined plane, and Moe stopped with front feet in the first tier of the stands. He bellowed.

The bull killed only one spectator, a man on whom he stepped. The hundreds who died killed themselves or each other. They

leaped from the towering rim of the ring, and they jammed the exits in writhing heaps.

Moe's precarious stance slipped. Slowly, he slid back into the ring, where Ringmaster Oswell, quivering in a red toga, gestured from the darkness under the stands. The fat man squeaked and waved. Moe's charge embodied the genuine fighting rage of a maddened bull. The scarlet door closed behind him.

Stonocypher, with fists bloody and a heap of unconscious fear-crazed spectators piled before him, sat down. "Well, Moe," he whispered, "I reckon you got even for a few of the bulls that's been tortured to death to amuse a bunch of nuts. Maybe it wasn't the right way to do it. I don't know. If I'd only had the gun—"

Catriona turned a white mask of a face up to Stonocypher. "They killed him, in theah?"

"Sure. Bullfightin' never was a sport. The bull can't win. If he's not killed in the ring, he's slaughtered under the stands."

"You have moash smart-bulls, Stony."

The black copter came in with the sunset and hovered over the sand. The face of Duellmaster Smith peered out under his black tam, while a hooded man, with pistols tattooed on his hand, aimed an automatic rifle. The duellmaster smiled at Stonocypher and cried, "You really should have waited until you were farther out in the Lake, before you dropped that little buzzer in the water."



Fights of the Future

TEN YEARS from now, our air fighting will probably be done by high-flying automatic machines controlled from the ground by technicians. War victims will be the unlucky ones on whom the bombs are released, while the men who do the actual fighting will be comparatively safe.

Powerful destructive bombs and intercepting missiles will chase each other at speeds, heats and heights that the human body could never stand. Until recently, the speed of sound was considered mysterious and unbeatable. Today, our fighting planes can beat this speed in short spurts. And this is only the beginning. The National Advisory Committee for Aeronautics, in experimenting with designs for planes and missiles of the future, is exploring the hypersonic regions. This begins at five times the speed of sound. And at more than five miles up, where superplanes must fly, sound's speed comes to 3,300 miles per hour.

The dangers at such speeds are tremendous. But there will be no reason for man to expose himself to these rigors. The machines that his skill and brains develop will do

that for him.

The danger of overheating is the principal barrier when planes and missiles are pushed through the air. At three times the speed of sound, the friction between the air and the surface of the plane produces a temperature of 600 degrees F. At five times sound, the temperature may reach 1,600 degrees. This would melt most metals into a shapeless mass, kill the crew and destroy the equipment.

This heat is created in the thin boundary layer of air around the aircraft. While for short spurts of ultraspeed it will not soak into the craft, for sustained flight even test planes must be virtually flying refrigerators.

Titanium and other such metals capable of beating the heat effect will be used to overcome this danger. There is even talk of constructing supersonic planes of a glass laminate made of fiber glass and held together by a suitable bonding resin, like polyester. The phenolics and melamines could also be used as bonding resins. From varied tests and uses, this type of glass appears able to withstand the searing skin friction temperature generated in ultra-high speed flight much better than most metals used in today's aircraft.

From all indications, air fighting of the future will probably be strictly impersonal. The machines themselves will be the pilots; the crew on the ground will merely start the machinery to working and guide them along their way. The wars in which our children and grandchildren will share will undoubtedly be infinitely more de-

structive, overwhelming and far-fetched than anything we can dream up in today's fiction.

The Robot Whipping Boy

THE ROBOT of science fiction may soon have an actual counterpart who will be used to perform the kinds of work that humans consider too dangerous—such as clearing up radioactive debris, dismantling bombs, closing broken gas mains, etc.

To operate this type of mechanism, it would be necessary to mount the robot on a vehicle radio-controlled from a console set up a safe distance away. The radio-controlled arms will manipulate like human arms, while the operator will get a three-dimensional view of the progress of the work through his binocular television camera. Thus, the mechanical hand responding to the action of the operator's hand will work almost with a sense of touch in handling the dangerous objects.

As the operator's hand closes upon an object, the mechanical hands will do likewise, so that the operator will feel the resistance imposed by the object that is being handled some distance away.

Lost New World

AT THE VERY bottom of the sea—a depth of approximately five, and in some cases $6\frac{1}{2}$, miles—there exists an entire world of sea life. This was described in the reports of a recent deep sea expedition made by a Danish naval vessel. Twenty-seven different va-

rieties of sea life were dredged up from their black world where they live in close to freezing temperatures, and under pressures of about 15,000 pounds to the square inch.

Included were all types of creatures similar to polyps and coral, all sedentary-type animals, but it is possible that larger and more active creatures such as a type of fish and squid also exist at these depths. Right now, however, it is impossible to do more than vaguely scratch the surface of this world, since we haven't developed the right tools for sea bottom research. What we have to work with now is still in a crude state.

Scientists also found that the bottom of the sea was infested with bacteria which showed major differences in character from bacteria found on land or in surface waters.

It's the last frontier on our planet: the bottom of the sea.

Watch Those Scales!

TO JUDGE from an 1800-year-old Roman bronze weighing instrument on exhibit in a Baltimore, Maryland, art museum, it would seem that the ancient Roman merchant didn't have as much of an opportunity to weight the scales as his modern counterparts do.

According to the instrument exhibited, the Roman scale worked on the lever principle. There is a 14-inch portable bronze rod which hangs by any one of three hooks, each on a different face of the rod. The item to be weighed is bung on hooks which are suspended from a

chain at the end of the short arm of the lever. This idea is very similar to that used in certain types of scales in use today.

Only a single counterweight, however, was used in the old Roman scale to balance the object being weighed. Its operation was simple: all one did was slide the counterweight back and forth along the graduated scale on the long arm of the lever until it balanced. The weight could then be read from the scale. The entire instrument has three faces and three scales, each one exposed when the scale is hung by its corresponding hook.

Voodoo Can Kill You!

THE EXPRESSION "scared to death" is more than just that. According to Dr. W. Proctor Harvey of Washington and Samuel A. Levine of Boston, writing for the *Journal of the American Medical Association*, it is possible to be literally frightened to death.

Although death from fright is rather rare, abnormal heartbeats caused by fright from a prolonged and highly irregular pattern which the doctors say could lead to ventricular fibrillation. This is a situation where groups of heart muscles beat independently and without rhythm and the heart is unable to pump blood, thus resulting in death.

Animal experiments show a nervous pathway from the hypothalamus—the base of the brain—to the heart. This—to a normal person in a highly frightening emotional situation—could cause types

of ventricular irregularities which could result in death.

The "voodoo" and "hexing" deaths of Africa and South America and Australia are not myths. They actually do occur. The emotional stress of the terrorized fear brought out by "voodoo" or "hexing" can cause death, but it would be a gradual process rather than a sudden one.

Things We Never Knew Until Recently

THE PREHISTORIC buffalo, according to bones recently unearthed in Texas, was almost twice as large as his modern progeny.

The reason women are usually smaller than men is that the female—or estrogenic—hormone has a growth-suppressing action which is exerted through its stimulation of the adrenal gland to produce hormones similar to cortisone. These hormones depress the rate of energy production and have a powerful action in checking replacement of skin cells and suppressing growth in general.

A cubic foot of atmosphere at ground level holds three million times the amount of air of a cubic foot of atmosphere at an altitude of 100 miles.

If laid edge to edge, the blood cells carried in the average adult human body would stretch 116,000 miles.

One ordinary glass marble could make 100 miles of glass fiber.

The energy in an average thunderstorm is equal to that dissipated by 50 A-bombs of the type dropped over Hiroshima.

Norm Venner's fancy was pretty well fixed on thoughts of electronic calculators—until the invention started making passes at the inventor!

THE Romantic Analogue

By W. W. Skupeldyckle

Illustrated by Ed Emsh

MATHEMATICIANS are just like people: old, young, fat, thin, male, female. This one was male, thirty-five, with steady brown eyes and a nice smile when he remembered to use it. His name was Norman Venner, and besides being a mathematical whiz generally, he had designed and built an electronic brain, or calculator, which was in some ways smarter than himself—and a lot less diffident.

Electronic calculators are invariably given acronymic names such as BINAC, SEAC, and MANIAC, and nine out of ten of them are of the digital type. This is a nice way of saying that they count on their fingers. They're nearly as big as yachts, and cost more, but can calculate a million times faster than any human.

Norm's machine was of the analogue type, which is less flexible, less complex, and vastly smaller

and cheaper. He called it the ICWEA (ICK-wee-ah), which stood for "I Can Work 'Em All!" It could, too! It was especially good at deriving equations from curves, which was really something.

Charley Oglethorpe burst into the office one morning, catching Norm in a brown study. "Hi, Genius. How is she perking now?"

"All right, except the pen skips a little sometimes and makes a messy curve."

"Have to damp that arm better. When can I have her to work on?"

"Soon as I finish these Mugu problems."

Charley stared at him.

"Mugu. Guided-missile center. It's nice business if we can get it—the digitals are all booked up months ahead, and the particular type of problem they send us is right up our alley."

"I thought you were kidding me,



like that Boolean Algebra stuff."

"Wasn't kidding then, either."

"I'll stick to instrument-making, thanks. You math guys never have any fun."

Norm shrugged, turned to the telephone, and called an extension.

"Hermosa." It was a rich, pleasant voice.

"Vic? How about the rest of the Mugu cards? Ready yet?"

"I'll send them up right away. Just finished them."

"Who was that?" Charley inquired.

"Vic Hermosa. Smart boy."

Charley smiled a little.

THERE WAS a knock at the door.

"Come in," Norm called. The door opened, and a small, neat girl entered. Her long bob was dark and silky, but windblown. She tossed her head and her hair settled into place, as if she had just brushed it. She extended a pack of punched cards.

"Thank you," Norm said, gravely.

The girl looked up at him suddenly, and he stepped back a little. She had surprising, deep-violet eyes, and their glance seemed to have a tangible impact. She nodded grave acknowledgment and left.

"Damn it, I wish I could do that!" Norm complained.

"Make goo-goo eyes?"

"No. Shake my head so my hair would automatically be combed like hers. I've been fighting this cowlick ever since I've been a kid—stocking caps, gunk, the works.

Still got it. And the part moves around and I have to hunt for it."

"Know who she is?"

"Nope. Clerk, messenger, I guess. They're always hiring new ones."

"Doesn't she ever speak?"

"Of course she—come to think of it, I've never heard her. Must say it's a relief after the usual yack-ety-yack. Haven't anything to talk to her about, anyway. She's just a child."

"A pretty one, though."

"Yes, she is."

"You sure don't know anything about women. If anyone made eyes at me that way, I'd do something about it."

"What, for instance?" Norm inquired dryly.

"Well, of course, I'm married. But I'd find out who she was, anyhow. Sometimes I think you're dead and don't know it."

"Sometimes I agree with you," Norm said. He fed one of the punch cards into the transmitter head, which fingered the holes and told ICWEA what the problem was. ICWEA began drawing a curve on the curve tracer. It would have taken Norm or anyone else days to arrive at the answer. "See? Skips here and there, but I can ink in the gaps."

"Looks like the pen catches on the paper a little. I'll grind the point while I'm at it. Say, that thing really thinks, doesn't it?"

"In a way. Generally, the digitals have it all over the analogues when it comes to reasoning, but I built an extra brain into her."

"Where?"

"The 'Y' path. Remember? Tries several appropriate methods in suc-

cession. I analyzed my own methods of attack, and built the same methods into her. She's an electronic me, except faster and more accurate."

"I bet. She's more alive than you are. Why don't you step out a little? First thing you know, you'll be getting old, and it'll be too late."

"Leave the match-making to the women. I may be old, but I'm not an old fool. It's fall, not spring."

"Yeah? All you need to be an old fool is just a little more time."

NORM IGNORED HIM, and took a card from his desk. It seemed to be an extra, not with the pack. He put it in the machine. The curve-tracer began to draw a rather abrupt curve, which meandered half across the sheet before Norm realized what it was. Suddenly, an image leaped to his mind's eye and he watched with fascination while the pen traced this mathematical impossibility to the far end of the paper, and in obedience to several successive negative factors in the problem retraced in the opposite direction a little lower down.

A head, a slightly lifted elbow, full rounded breast, a knee luxuriously drawn up, a dangling arm, all in one continuous line. There was nothing obvious about it; it was formalized, but with the individual style that is the artist's signature. Once seen, the image persisted.

"Hey, Charley, look at this!"

"Yeah. What about it?"

"What about it! You ever see anything like it?"

"Sure. It's a closed loop, like a hysteresis curve."

"An hysteresis curve. But this isn't one. Look closely."

"Of course, it has harmonics and variables in it. Might be one of those gas-discharge curves, if the gas tube happened to be defective. I've seen some funny . . ."

"Look! It's a reclining figure, with the head turned toward you—see?—and the forearm over the head—*here*. Breast, knee here, foot with the toe pointed, calf, thigh, and the near arm hanging. Remarkable, once you see it . . ."

"You're crazy. All I can see is a closed loop with some wrinkles in it."

"Why, it's nearly as plain as a photograph! I can't understand . . ."

"Plain, my eye! If that's the arm hanging down, and this the hand, where are the fingers? That 'hand' is just an oval. You got some imagination if you can get a reclining figure out of that."

"Not a nude of the beer-garden type, I grant you. This is real art. Know what this means? Have you any idea how complex a formula must be to trace a curve like this? Just a plain hyperbola is bad enough. This is a test of the machine. Those Mugu boys have worked out this formula to see if she could break it down and draw the equivalent curve, though I don't see how they did it. Even the larger digitals would find this a tough nut to crack, but our baby is a whiz at curves, see? I wonder how they justified the machine-time on it. Of course it is barely possible that they derived the equa-

tion themselves, but it must have taken weeks if they did."

"Maybe it took us long as you say, but I still can't see any reclining figure in that curve. It's just a closed curve with some wiggles and humps on it."

"In any case, I'm going to send this to Mugu right away. They'll want to know how long it took."

"I wouldn't, if I were you."

"Why not?"

"Maybe trouble developed in the machine. Better run some more cards through it first. But right now I'm going home. We're having a roast tonight. Say, why don't you come to supper with us? Alice would be delighted—she was just wondering what happened to you. I'll phone her . . ."

"No, no! I have to—look, I got to find out what this means, you see? It isn't that—explain it to Alice, will you? We need this contract, need all the work we can get, you understand?"

"Sure, sure. How about next week? OK? Well, see you in the morning." Charley left, grinning to himself as he closed the door behind him.

NORM DIDN'T SEE the grin. He was already puzzled enough; IGWEA behaved herself perfectly on the next five cards, and kept her mind on her business. Meanwhile, Norm studied the first curve again. Funny Charley couldn't see it—the figure was puzzling at first, until you got the idea, but then it was so clear. Or was it?

Suddenly, he couldn't see it himself. He turned it upside down and

sideways; it was just a funny closed curve, having neither mathematical nor structural significance. Maybe he was going crazy!

He threw the curve down on his desk and, soothed by the whirring of the tracer motor, fell into a brown study. Suddenly, the image of the brunette with the violet eyes appeared. No reclining nude, she; she shook her head in that habitual gesture and her long bob fell perfectly in place. She turned, with demurely downcast lashes and looked up at him with her violet eyes, and Norm came out of his trance with a start.

He removed the last curve—a simple hyperbolic curve, probably a problem in attenuation or decay of some kind—and put in the last punch-card. The machine started up immediately; the curve was elliptical. Then a vertical downstroke, retraced and with a gentle half-loop added. It was writing! P-r-o-p-i-n-q . . . What might this be? He watched, fascinated, as the letters continued. "Propinquity is the mother of love," it said, and stopped.

His trained mathematical logic gave him an immediate solution to the enigma: he was cracking up. It was utterly impossible to derive the equation to write "propinquity" in Spencerian script in less than a hundred man-hours, nor could a mathematical calculator be hired for so frivolous a purpose. It was fantastic, impossible; therefore, it was not so, and he was either dreaming or crazy. Maybe thinking about that little brunette . . . Surely not; still, he had been driving himself pretty hard. In the morn-

ing he would be fresh and alert. If it were a trick, he'd catch the trickster. And if it turned out to be a perfectly logical curve, he'd see a doctor.

He left the curve in the machine, closed the ventilator in the wall over his desk, and turned on the burglar alarm. This was nothing so crude as a loose board with a switch, but a quite elaborate electronic circuit that produced a field near the door. It wouldn't work on ghosts, but if any material body entered that field, it would trip the alarm and start a regular Mardi Gras. Security required by government contracts hardly demanded so much, but for a small plant it was sufficiently cheap, and Charley had had a lot of fun with it. Charley! Have to keep him out, too; and being its daddy, he'd know how to disable the alarm. Of course, it would really be sufficient to tie a thread across the door which would break if anyone entered. He had no thread, but after a moment's thought, he pulled a three-cent stamp out of his bill-fold, and turned out the office-light. After glancing up and down the hall, he stuck the stamp on the door so that it would tear if the door opened.

IN THE MORNING, the stamp was still intact, and it was hard to see, even in broad daylight. The paper in the curve-tracer was perfectly blank, and there was no punch-card in the transmitter head. It might still be an elaborate joke, but the chances were small. He might be cracking up, or may have imagined the whole thing.

The best thing to do would be to put it entirely out of his mind.

He succeeded in this until mid-morning, when ICWEA called him a "handsome devil." He jerked the punch-card out of the transmitter and called Vic.

"Hermosa."

That voice! It made chills run up and down his backbone. A man had no right to a voice like that. "Vic? Bring up the calculations for the last batch of punch-cards, will you? I want to check something. The card numbers are F-141 through F-152."

"Right away."

Vic wasn't especially gabby. A good-looking young Latin, who knew as much math as most, they'd probably lose him to the draft any day now. Presently, someone knocked on the door.

"Come in."

It wasn't Vic; it was the girl. She laid the pack of problems and their attached work-sheets on the desk, shook her hair into place—did she even have to comb it in the morning when she got up?—looked him briefly in the eye, and turned to go.

"How is Vic these days?" Norm inquired, whimsically. "Is he able to get about?"

The girl smiled politely at this obvious badinage and left.

He checked the problems against cards as he came to them. He knew the punch code well enough to do this in his head, since the kind of operation indicated was quite obvious. But the problems ended with F-151, and the "handsome devil" card was F-152. He got on the phone again.

"Vic? What's your next card number?"

"F-153." One expected a little guy to have a high voice; this one was quite deep, but soft.

"Are the cards numbered very far ahead?"

"We usually number a couple of dozen cards, and assign the numbers to the problems as they come in, from a scratch sheet."

"Any of the cards been lost?"

"Oh yes, on occasion. So far, we've recovered them all—there are only two rooms where they could be. Up there or down here."

That voice! How could a man have a voice like that? And why should he care if one did? Why even notice it? Instead of going to the cafeteria for lunch, he drove downtown and consulted the family doctor, who laughed at him. Reassured, he returned to the plant and got a sandwich and milk before going to his office. Old Doc Heffelbauer might be wrong, but he usually wasn't. Norm liked several men, but he didn't dream about any of them; if he was off his rocker, it was in some other manner. Visual delusions, for instance.

The thing to do was to see Vic face to face. He called the office manager. "Henry? Send Vic Hermosa up there, will you? I want to talk to him."

"Vic Hermosa? He's in the Army. Didn't you know?"

"No, I didn't. Who is the guy that answers the phone in that fruity voice?"

Henry lowered his voice. "Guy? That's Vic's sister Virginia. She took Vic's place when he left. Sim-

plified the security investigation, and she's good, too. About as good as Vic, I'd say."

"You mean to tell me a little girl like her could have a voice that deep?"

"Startling, isn't it? Of course, it's actually a low contralto or tenor, but you expect her to be a lyric soprano. Shall I send her up to see you."

"No, no. I want to think a bit first. Say, who interviewed her?"

"Charley, I suppose. Just a formality, anyhow; the Hermosas and the Oglethorpes are neighbors, you know."

WONDERFUL STUFF! Esoteric phenomena in a sealed office! His very own calculating machine made calculated love to him; his best friend was evasive, and the junior mathematician he thought he had been talking to every day for a couple of weeks was in the army. He might hammer away at all concerned until all the cards were accounted for, but that would disrupt office routine. Strategy, that was the thing! Be mighty peculiar if he couldn't break up this business, now that he had an idea what was going on.

But did he? Whoever punched the cards needed the proper equations derived first, and that called for a digital or an analogue computer. Preferably his own ICWEA, because she was especially good at curves. Deriving them by the old methods was just too much horse-work for any joke. And it didn't have to be a joke, either. The joke might be just the cover for a more

sinister activity—bosh! If that were the case, why call attention to it with funny-business?

But what hurt was the girl's being mixed up in it. He could take a rib from Charley, for instance, but the girl was practically a stranger—unfortunately. Women could be cruel, as his mother had often warned him. He thought of his mother's last year in the hospital and winced. She had sacrificed so much for him; and yet, was it really better to be a free bachelor than an old family man like Charley? There wasn't anything the matter with Alice that he could see. Charley loved her; that was plain.

Tonight should solve the thing, once and for all. He left the plant, speaking to everyone he met as he usually did. Then he sneaked back in, with the guard's help, and hid in his own office with the lights out.

His phone rang and he almost answered it before he remembered that he was supposed to be gone. The building was by no means deserted; probably there was someone working overtime in more than one department, though the main business for the day was finished. After a bit, the phone rang again, and he ignored it.

Waiting was hard. He couldn't read, so he let his mind wander: the next modification to ICWEA—what a romantic old thing she was! He needed a haircut; he'd have to get one tomorrow, before the hair grew down over his ears. What a voice that girl had—and those eyes! Would they get further work from Mugu? How could they con-

tact other Government agencies? ICWEA was working out pretty good; would it be better to try to sell ICWEAs to anyone who wanted them, or to keep the old girl busy and work problems for others? Eventually, the former, though for the time being it might be better to continue as they were until the old girl was well known. Under present conditions, that shouldn't take—what was that hissing noise, a radiator?

He listened closely. Hiss, hiss, hiss. No, it was a rubbing sound, with a scrape and an occasional hollow thump. Not loud, but close at hand. The ventilating system—how obvious, now! He watched a white hand disengage the catches and carefully lower the grill to his desk. A small figure in white coveralls wormed its way out of the opening, landed on its hands on top of his desk, kicked feet clear and cartwheeled to the floor with disdainful ease. A head-shake settled a long bob in place; who could do that? Virginia Hermosa, and no one else!

She couldn't see him against the shine of the window. She turned ICWEA on and let her warm up, meanwhile fastening a large sheet of paper on the bed of the curve-tracer with tape. She put a blank card in the punching head, opened the door of the patching-panel cabinet and rearranged the patch-cords there.

What a lab assistant she would make! Wasted in Set-up; anyone could punch cards, with a little practice. Well, not anyone, but any mathematician could. How thoroughly she knew this machine!

Charley must have told her, or her brother, plenty!

With the curve-tracer running at slow speed, she held the stylus steadily on the words she had written on the paper; the coordinates and rates were fed into ICWEA's brain, she derived the horrible equations corresponding to the script, and obligingly translated these in turn to punchings on the card.

So simple, when you saw it. But who would think of putting a burglar alarm on an air-duct? She could go all over the building through the walls if she chose. She was small enough to get through the ducts easily, though the vertical sections must be tough, even for so athletic a girl.

The punching head stopped. Virginia restored everything to its original condition, stuck the card she had punched into a pile of others, folded the paper and stuffed it into her pocket, and turned to go. Norm put on the lights.

STARTLED, she whirled, churning the air with her hands to keep her balance. He held his hand out for the paper.

"No!" she said, her voice shrill with excitement.

Wordlessly, he closed in on her, and after a brief struggle pulled the paper out of her pocket.

It said, simply, "I love you." Norm looked at Virginia, who turned her head away.

"I can't appreciate the joke just now, though I realize it must be very funny. Charley will enjoy it. But what a lot of trouble. Suppose

you had got stuck in the duct, then what? Is it worth the risk? And the violation of security is very serious."

"I'm going to quit anyway," she muttered.

So deep a voice for such a small girl! "Why did you do it?"

"Well, it all started as a joke. Charley said you were shy, and—and—well . . ."

"I see. Natural enough, I suppose. And you pretended to be your brother on the phone."

"No, I never said I was Vic," she denied, quickly.

He was handling this all wrong; he wasn't getting anywhere. All this was just talk, evasive talk. "Charley hired you?"

"Yes. When Vic left for basic training."

"I see. Charley's quite a joker, and it was hard to refuse him."

"It was kind of a joke at first, but you're overlooking something; he's very fond of you. He really is! He brags all the time about how smart you are, and what a nice guy."

"Charley's married, and he wants to see me married, too."

"And you don't like girls?"

"Listen, you made that drawing, too, and all the other stuff?"

"Yes."

An idea raised its pretty head. "Listen, I've decided to be very angry about this. You've made a fool of me, and I'm not going to let you get away with it. Now, I know a place that's quiet, and has very good steaks; I'm going to take you to supper and bawl you out. Better get into street-clothes, and don't take all night."

"Sorry, I couldn't possibly. Some

other time, perhaps."

"Tonight. Now. Get going."

"No. I have a date."

"Break it!"

"No! You may be my boss, and I may be a forward hussy, but tonight I'm going home, and you can't stop me!"

How silly could you get? Suddenly he understood the way of a man with a maid; love was older than conversation, and they both saw and understood through and beyond any silly words. In fact, the sillier the words, the better!

"That's what you think! You're going with me, or you're going to jail. They'll put you in a dark cell with the rats. They have their own specially-bred rats, you know." He leered, slyly.

"You wouldn't dare!"

He shrugged, elaborately, and turned to the phone. She darted past him to the door and he caught her, pulled her back out of the hall. She was surprisingly strong and determined, and she ducked when he kissed her.

"That one was a mess, wasn't it?" he complained.

She relaxed and began to laugh, and he joined her. She looked into his eyes a long moment, and

pulled his head down, kissed him tenderly. "You don't give a girl much choice—one big rat or a lot of little ones."

"I'll give you no choice at all. I'll teach you to play tricks on me! Hurry up and change."

"One of the girls keeps a semi-formal in her locker. I can borrow it and we could go dancing."

"I don't dance. Never learned. Couldn't we just talk?"

"We could, but we won't; you'll never learn any younger. You seem light enough on your feet. Come on, it'll be fun!"

"Tonight I can do anything! You take too long to change, and I'll tear the building down brick by brick with my bare hands, hear me?"

"No, please don't! I'll hurry, I promise!"

He waited impatiently at the door of the locker room. Now that he knew how to talk to a girl, he wanted to talk, and talk, and talk some more. He planned extravagant things to say when she came out, but when she appeared, smiling, he was struck dumb. She took his arm and they half ran, half skipped out of the building to his car.

————— THE END —————

BACK ISSUES—For those who collect science fiction magazines, and for those reading IF for the first time who want to catch up on the good stories they've missed, we have managed to obtain a limited number of copies of all earlier issues. They're available at 35c each, from the Circulation Dept., Quinn Publishing Co., Kingston, N. Y.



If this story has a moral, it is: don't shoot too soon, or you may never know what you hit!

IN THE FOREST

By Leslie Perri

Illustrated by Dick Rockwell

THERE was a wind. It blew through the topmost branches of the tall trees in a silent, autumnal forest. Dry leaves trembled nervously as the dark tree trunks stirred in a thrust of the wind. A

scarlet maple leaf lay unmoving on the inky surface of a cold spring. Behind an interlacing of nakedly-white birches a young deer stood still with wide lacquered eyes fixed on him. Its tar-black nostrils shone

in a quivering of fright and then like the wind it rustled momentarily on the forest floor of crackling leaves and disappeared.

He breathed heavily with disappointment. He had transmitted fear, his own apprehensions, again.

He moved from the protection of an overhanging rock. The ease with which he moved delighted him sensuously. This sportive exhilaration had to be curbed; it made him less sensitive to the problem at hand. He had to communicate.

There were obviously lower orders, mainly the winged beings. Some were tiny and fragile. They would approach and light on him with the unwariness of the naïve, trusting to their speed to escape from danger. From them he had no consciousness of intelligence. They buzzed and swarmed and hummed with monotonous idiocy. The larger winged beings were more interesting but they wore the drabness of the forest on their sleek wings. They would not come close but made inquiring sounds and swooped away at his approach.

He had learned to move silently through the silent forest. He felt almost weightless and infinitely agile and this delight he had to renounce for the time. He could walk erect, or run with incredible rapidity. And when he stood erect his body attained a new vitality and with his head above the lower woody vegetable growths he experienced a new dignity and regality. He was no petitioning refugee from the pitiless vise of unending cold. Here in this autumnal forest was the warmth and promise

of spring, for him.

Excitement made him warmer and more jubilant still. He had to communicate. But with whom? With which of these beings could he share his unbelievable adventure? He ran down a sloping floor of the forest and ran and ran, slipping and sliding on the leaves until he was breathless. And came to halt in a marshy spot with the spikes of dried vegetation towering about him. His heart beat with transcendental joy. He ached to babble of his happiness and then to relive his adventure in the telling of it to another intelligence the equal of his.

He breathed more slowly and more slowly yet. Above the trees, caught in the web of branches, a brilliant blue sky gleamed and virgin cloud forms of purest white drifted slowly above the trap of the forest. And there, lower than the clouds, was the magnificence of a burning sun, a brilliance whose golden shadow warmed the tree trunks, the faces of the dry leaves, the soft, sucking black earth of the marsh and—him. In this warmth he luxuriated, with every sensibility in his being. His body had starved for warmth.

And while he stood thus, a long slithering form passed before him, describing in its movement across the moss and rocks and black leaf-moulded earth resilient, graceful curves. It passed him without notice, conveying nothing, an impenetrable life form.

And then, as suddenly, his muscles tightened and he withdrew reluctantly from the warmth of the sun.

HE MOVED closer into the dried, tassel-topped grasses, feeling the scrape of sharp seed-bearing burrs as they clung to him. In a closely woven burrow, hidden from the sun and the reach of the wind, he heard a new sound, a louder, sharper crackle in the forest. A new scent crowded into the burrow and overpowered him with a new sensation, a suffocating awareness of danger.

He was cold again, and taut. The shadow from which he had escaped enclosed him again. This same deadly shadow of fear sapped his new vitality and destroyed his senuous joy.

There was that sharper sound, a baying shrillness that resounded through the forest quiet and hammered at the tree trunks and unresisting vegetation with an unreasoning insistence. The echo of this new, insane voice of danger stirred him.

He moved cautiously and quickly from the burrow and through the marsh. He was not erect now, but low and rapid-moving. He thought desperately of survival now, not communication. This howling, yapping being had found him out, scented him in the forest and he knew only that he had to escape.

The forest floor rose gradually to greater and greater heights. He recognized the terrain and the character of this part of the forest. There was, at the summit, a sudden drop down a face of irregular outcroppings of stone. And at the base of this lay a vast body of water in which he could hide. He could manage the tall face of stone,

hiding and blending into its cold greyness.

The baying and yapping was closer and he moved even more rapidly. The chase seemed directed to him, not purposeless. Behind the baying and shrill crying of this hunter was yet another will. And this chilled him with hopeless horror. He felt instinctively that he could communicate with *this* will, that this was the intelligence he sought. But between it and him was this unleashed agent for his destruction.

He ran more quickly and with a new sensation of weariness as the slope mounted. The vegetation was green here, and somewhat sparser. There were fewer places of refuge. At times he ran without the protection of any covering, only the moss and green ground vines underfoot.

As he reached the summit he heard a new sound, a sharp undecipherable crack and whine overhead. When he had reached the top of the sharp rise, he stood erect for a moment, seeking the surest path for his descent of the sharp rock face. The body of water below gleamed warmly blue. The sun was a glorious, almost perfectly round entity, low in the sky. His body straightened involuntarily, rose up in the warmth of the sun, darkly and strangely outlined against the unbroken blue of the sky. And then as the crack and whine of the gun sounded in the evening quiet, not once but twice, and inexpertly a third time, his shape crumbled against the sky and he toppled from the cliff edge into the still blue of the lake below.

The man breathed heavily as he came up the hill. He was red-faced from exertion and frustration. He was heavy and clumsy in the perfection Abercrombie and Fitch had tailored into his hunting clothes. He held his rifle, an expensive and aesthetically beautiful instrument of destruction, like a blunt, ugly club.

He stood at the edge of the cliff

and looked down. There was nothing. Only the serenity of the early evening, the unanswering quiet of the lake, the ridge of mountains, the darkening sky.

"Now what in the hell was that?" the man muttered.

The dog, beside him, shivered and sat down suddenly. Its howl was unbidden, undirected, and it filled the forest with unrest.

THE END

SPACESHIP—1975

"A SPHERE of dully gleaming metal some fifty feet in diameter, it rests on stubby, retractable legs beside the buildings of the port center. Carriers speed to and fro from refrigerated warehouses, carrying cargo to the conveyer lift built into the ship's base.

"The load consists of 8,000-odd men and women, each frozen solid in a coffin-like block of chemical ice. Living organic matter is the one thing the duplicator units can't reproduce . . .

"Now the last of the ice-blocks is aboard, the dozen-odd crewmen at their stations, the hatches sealed. The sphere floats for a moment, barely off the ground, while the stubby stabilizing legs retract. Then, slowly at first (in order to avoid the heat of atmospheric friction) it soars into the sky. No one knows for sure how fast

it can go. In theory, gravity acts instantaneously, and even the electro-magnetic waves that carry power travel at up to 186,000 miles per second. . ."

This is a quotation from "The Sky's No Limit," an article in the March 1953 issue of *The Sooner Magazine*, which is published by the University of Oklahoma Association. It was written by Dwight V. Swain, old-time science fiction writer and instructor in journalism at that school. Mr. Swain sneers at rockets but says we'll have space travel by 1975; the key inventions will be a "wireless power transmitter," a "contragravitational device," and a "transmutational duplicator"—this last being an answer to all problems of supply.

Far-fetched? Maybe. But though we're betting on rockets, Mr. Swain just might have something there.

A CASE OF CONSCIENCE

(Continued from page 51)

done to do it in another way. Ruiz-Sanchez raised his hand. Immediately Chtexa walked toward the ship.

"I wish you a good journey," the Lithian said, "wherever you may go. I wish also that your road may lead back to this world at some future time. I have brought you the gift that I sought before to give you, if the moment is appropriate."

Cleaver had straightened up and was now glaring suspiciously at the Lithian. Since he did not understand the language, he was unable to find anything to which he could object; he simply stood and radiated unwelcomeness.

"Thank you," Ruiz-Sanchez said. This creature of Satan made him miserable, made him feel intolerably in the wrong. How could Chtexa know—?

THE LITHIAN was holding out to him a small vase, sealed at the top and provided with two gently looping handles. The gleaming porcelain of which it had been made still carried inside it, under the glaze, the fire which had formed it; it was iridescent, alive with long quivering festoons and plumes of rainbows, and the form as a whole would have made any potter of Greece abandon his trade in shame. It was so beautiful that one could imagine no use for it at all. Certainly one could not fill it with left-over beets and put it in the refrigerator. Besides, it would

take up too much space.

"This is my gift," Chtexa said. "It is the finest container yet to come from Xoredeshch Gton; the material of which it is made contains traces of every element to be found on Lithia, even including iron, and thus, as you see, it shows the colors of every shade of emotion and of thought. On Earth, it will tell Earthmen much of Lithia."

"We will be unable to analyze it," Ruiz-Sanchez said. "It is too perfect to destroy, too perfect even to open."

"Ah, but we wish you to open it," Chtexa said. "For it contains our other gift."

"Another gift?"

"Yes, a more important one. A fertilized, living egg of our species. Take it with you. By the time you reach Earth, it will be ready to hatch, and to grow up with you in your strange and marvelous world. The container is the gift of all of us; but the child inside is my gift, for it is my child."

Ruiz-Sanchez took the vase in trembling hands, as though he expected it to explode. It shook with subdued flame in his grip.

"Goodbye," Chtexa said. He turned and walked away, back toward the entrance to the path. Cleaver watched him go, shading his eyes.

"Now what was that all about?" the physicist said. "The Snake couldn't have made a bigger thing of it if he'd been handing you his own bead on a platter. And all the

time it was only a pot!"

Ruiz-Sanchez did not answer. He could not have spoken even to himself. He turned away and began to ascend the cleats, cradling the vase carefully under one elbow. While he was still climbing, a shadow passed rapidly over the hull—Cleaver's last crate, being borne aloft into the hold by a crane.

Then he was in the airlock, with the rising whine of the ship's generators around him. A long shaft of light from outside was cast ahead of him, picking out his shadow on the deck. After a moment, a second shadow overlaid his own: Cleaver's. Then the light dimmed and went out.

The airlock door slammed.

THE END

THE TROUBLE WITH BUBBLES

(Continued from page 65)

A Red Cross ship landed, its ports grating open. Dollies shuttled across to it, loading injured men.

Two relief workers appeared. They opened the door to Hull's car, getting in the back. "Drive us to town." They sank down, exhausted. "We got to get more help. Hurry it."

"Sure." Hull started the car again, gained speed.

"How did it happen?" Julia asked one of the grim-faced exhausted men, who dabbed automatically at the cuts on his face and neck.

"Earthquake."

"But why? Didn't they build it so—"

"Big quake." The man shook his head wearily. "Nobody expected. Total loss. Thousands of cars. Tens of thousands of people."

The other worker granted. "An act of God."

Hull stiffened suddenly. His eyes flickered.

"What is it?" Julia asked him.

"Nothing."

"Are you sure? Is something wrong?"

Hull said nothing. He was deep in thought, his face a mask of startled, growing horror.

THE END

THE *Postman* COMETH

PERSECUTION COMPLEXITIES

Dear Sir:

Your issue of March, 1953, contained an article entitled "Galileo the Persecuted." That Galileo was persecuted is true, but as to why he was persecuted your author seems to be mistaken.

1. It was not heresy to teach the Copernican theory.

2. The question revolves around, not the subject matter of his teaching, but *how* he taught it.

In the first place the work of Copernicus, "*De Revolutionibus Orbium Caelestium*," which was published many years before Galileo, owed its publication to the financial support of two Catholic Cardinals and was dedicated to Pope Paul III. This is established historical fact. Would a Pope—any Pope—allow a heretical work to be dedicated to him?

Second, Galileo taught the Copernican theory as an established fact, not a theory. Newton (1687) proved the theory, not Galileo.

One other point; Galileo, in supporting his theory, rejected the tra-

ditional interpretation of some of the texts of the Bible. For this he was punished, not for trying to advance science or for being so intellectually in advance of his time.

Every issue has two sides; maybe the author would like to investigate my side. Let him review Cardinal Nicholas of Cusa (1401-1464), Canon Copernicus (1473-1543), and an article on this subject by Hilaire Belloc in "Difficulties," published 1932, London, by Eyre and Spottiswoode.

—Thomas F. Hardacre
124 Myrtle St.
Lawrence, Mass.

HIS PAIN, OUR GAIN

Dear Editor:

I dislike writing letters of praise, but I am of the opinion that one is in order for the March issue. I read a lot of science fiction: good, bad, indifferent, and sometimes—stinking. I usually write of the stinking issues of magazines, so it pains me deeply to write a letter such as this.

Ivar Jorgenson's *Deadly City* was better than good, and likewise for Kenneth O'Hara's *Thy Name is Woman*. The overall effect which everyone I know got from the last-mentioned story is the one I believe the author intended: a good "sick" feeling.

There are three other stories in the March issue which I consider outstanding: Bryce Walton's *The Victor* (although I cannot conceive of any victory, other than death, being possible: overthrow of "the system" being impossible), Frank Quattrochi's *The Sword*

(well-written, with no weaknesses in plotting), and Waldo T. Boyd's *The Salesman*, a neat, well-written bit of subtle humor so rare in science-fiction.

I'd like to compliment your art editor, Ed Valigursky, for his fine choice of story illustrations. The cover-picture, and the two black-and-white pictures inside, are excellent and in the best taste.

Your magazine make-up, by the way, was discussed in the Department of Journalism of the University of Houston as an outstanding example of good make-up.

—Edward F. Lacy III
6923 Schley St.
Houston 17, Texas

EXCUSE OUR AIRFOILS

Gentlemen:

I should first like to compliment you on the breadth and conceptual design of the inside cover drawings in the March issue of IF.

However, to be a bit technical; granting that the invader rocket would have wings and control surfaces for navigation in an atmosphere, and granting further the air intakes since the craft might on occasion change over to jet operation—it is not conceivable that the homing missiles would have airfoils of any nature.

Since the missiles are obviously designed for operation on and around an airless world, airfoils as lifting or control surfaces would be totally useless and superfluous.

If guidance is to be achieved, reaction vanes in the exhaust stream or rocket steering nozzles must be employed.

But the drawings are lovely.

—J. R. Schoenbaum
Chief Engineer, Airllectron Inc.
P. O. Box 151, Caldwell, N. J.

WIDE MARGIN FOR ERROR

Gentlemen:

Curiosity impels an inquiry about my story in the March 1953 issue of IF.

Why did you change the name?

I am not refering to the name of the story, for in all justice I have to admit MARGIN OF ERROR is a better title than the one I submitted. I mean why did you change the name of the author?

Does Deerning have a nicer ring to it than Deming?

—Richard Deming
787 Central Ave.
Dunkirk, N. Y.

Well, yes, since you ask. But we do apologies.

ENCORE, PLEASE

Dear Sir:

I would like to make a suggestion, hoping you will be able to adopt it. Could you persuade the author Kenneth O'Hara to write a sequel to his "Thy Name is Woman"? The possibilities for such a story are many. The theme of that novelette, as you know from recent newspapers, is not so extraordinary, but the build up could be made so.

I do sincerely hope that this suggestion can be worked, and believe me I shall await each edition.

—John H. Hayes
32 Main St.
Bethel, Conn.

It's safe to say Kenneth O'Hara will appear in these pages again, though any sequel must be at least as good as the original to be accepted, and that isn't always easy. As for the timing of "Thy Name is Woman," it was sheer coincidence; science is catching up with all kinds of science fiction!

QUESTION AND ANSWER

Dear Sir:

I like Ed Valigursky's illustrations but how in the hell can his space-ships land?

—Bert McDoughe
Belpre, Ohio

The inside covers of this issue show (a) a spaceship landing and (b) a spaceship landed. Any other questions?

WE WON'T STAMPEDE

Dear Mr. Quinn:

I should like to congratulate you. On what? On not being stampeded in a blind panic, into making a horrid thing out of your mag, but instead, hewing to the line and using discretion and discrimination and excellence as criteria for selecting the stories you print.

What do I mean by "thing"? Well, it's that nauseous combination: big-name, spillane-lonnigan, yellow-journal-hollywood thing that so many editors seem to think they have to have or go on the rocks, heck knows why. Please stay like you are, huh? Don't catch that squirrelly virus. If you stay like you are

you'll be thriving when the rest are just a memory in the Congressional Library files.

Say, if you're not careful, you're liable to become the best mag. And that's some statement, from a fan who has been firmly loyal to *Astounding*, since volume one number one!

—Phyla Phillips
222 East 7th St.
Mishawaka, Ind.

Thank you, Phyla. We're blushing slightly, but you summed up our present and future editorial policy so well we couldn't resist printing your letter.

STF'S BIG SHOW

Gentlemen:

Willy Ley has accepted our invitation to be the guest of honor and principal speaker at the 11th World Science Fiction Convention, which will be held at the Bellevue Stratford Hotel in Philadelphia over the Labor Day weekend this year. Willy's scientific accomplishments are many and varied, and his talks are always delightfully entertaining, so this is sure to be a worthwhile event for fans and readers.

Willy's talk will climax an exceptionally interesting program; we've made a special effort to surpass last year's Chicago convention and think we've succeeded, though it wasn't easy. Memberships or further information may be obtained by writing Box 2019, Philadelphia 3, Pennsylvania.

—Milton A. Rothman



TITAN is the largest of Saturn's nine moons—almost as large as the planet Mars, in fact! The satellite is believed to have an atmosphere, and it is also probable that water is in a perpetually frozen state at present. The man in the foreground above is sampling data, while the other two gaze at the cloud-covered planet and its unique rings.
(Drawings by Ed Volgurtsky)

